

Theoretical Thermodynamic Properties of Gases at High Temperatures and Densities with Numerical Results for Hydrogen

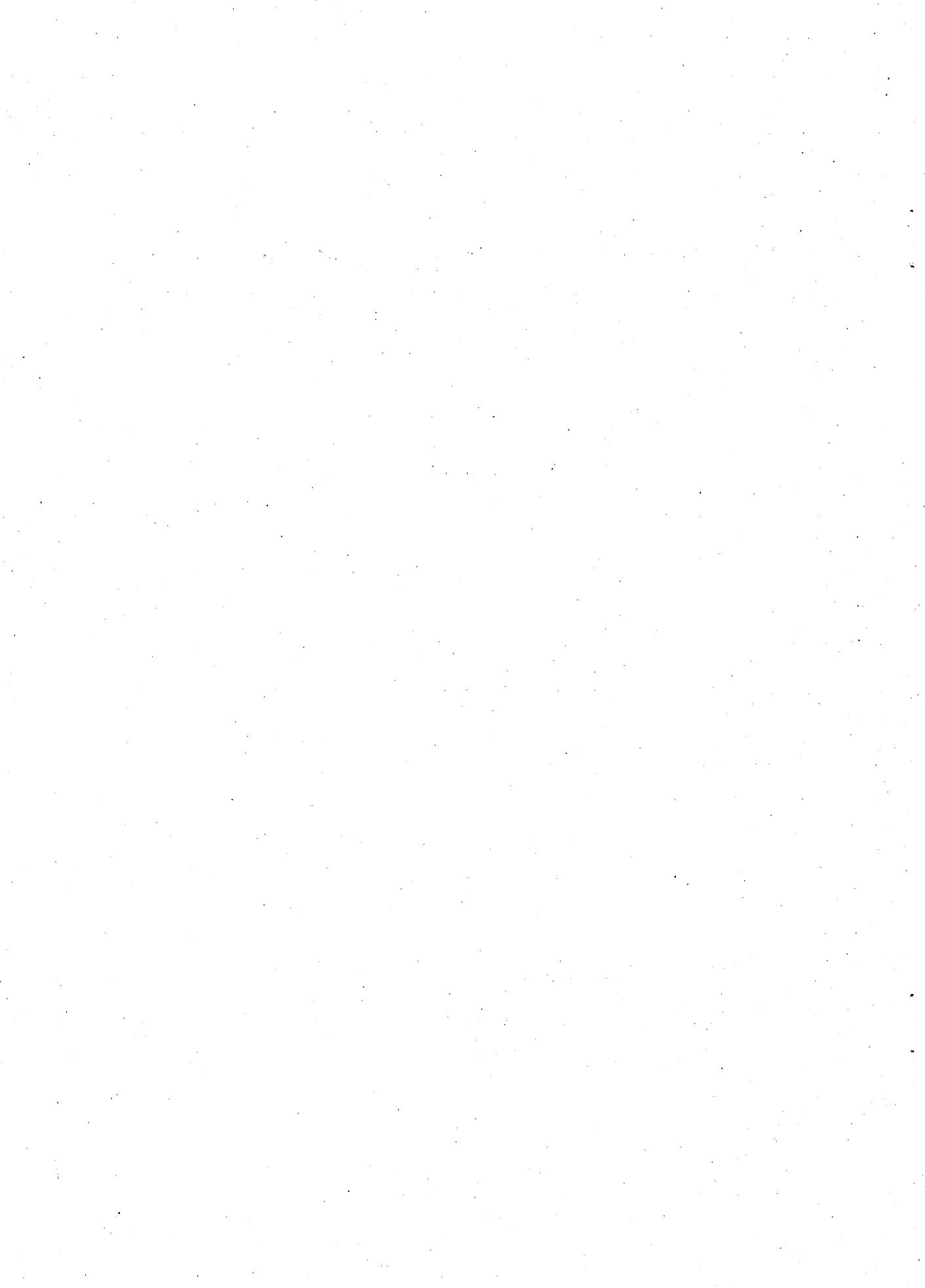
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ABSTRACT

The partition function corresponding to an equation of state for a high-temperature, high-density gas suggested by J. S. Rowlinson has been derived. The equations for selected thermodynamic properties of the gas are obtained from this partition function using statistical thermodynamics. These equations are used to calculate results for the case of hydrogen in the range of temperature between 500°K and 3000°K and in the range of density between 1 and 2000 amagats.

PROBLEM STATUS

This is an interim report; work on the problem is continuing.

AUTHORIZATION

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THEORETICAL THERMODYNAMIC PROPERTIES OF GASES AT HIGH TEMPERATURES AND DENSITIES WITH NUMERICAL RESULTS FOR HYDROGEN

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INTRODUCTION

An equation of state for high-temperature, high-density gases has been suggested by Rowlinson (1). The partition function corresponding to this equation has been derived, from which has been calculated the hydrogen-gas properties reported here. The significance of this equation of state is that it accounts for the temperature and density dependence of (a) the two-body, intermolecular forces and (b) the volume occupied by the molecules.

An equation of state which includes these effects can be derived in principle from either of two thermodynamic relationships. One, which will be referred to as the pressure equation, comes from the fact that the internal energy of a gas is composed of two parts. The first part is associated with the kinetic energy which is independent of intermolecular forces and corresponds to the ideal gas term. The second part is associated with the intermolecular forces and depends on the radial distribution function of the gas molecules $g(r)$ and the molecular potential $\phi(r)$ or intermolecular forces $-d\phi(r)/dr$. This pressure equation is (2)

$$P_v^{\ddagger} = RT - \frac{N_0^2}{6v} \int_0^{\infty} g(r) \frac{d\phi(r)}{dr} 4\pi r^3 dr , \quad (1)$$

where N_0 is Avogadro's number.

The second relationship from which one can obtain an equation of state for a real gas was developed by Ornstein and Zernike (3) and will be referred to as the compressibility equation:

$$-\frac{RT}{v^2} \left(\frac{\partial v}{\partial P} \right) = 1 + \frac{N_0}{v} \int_0^{\infty} [g(r) - 1] 4\pi r^3 dr . \quad (2)$$

Both equations make the assumptions that (a) all intermolecular forces are two-body forces only, (b) the intermolecular potential is spherically symmetric and, therefore, only a function of radial distance, and (c) classical mechanics applies. The radial distribution function, if correct, should yield the same result from both Eqs. (1) and (2). This agreement has not been possible to achieve, because an exact solution requires the consideration of three-body interactions. Percus and Yevick (4) have suggested an approximation in which three-body interactions are taken in pairs. Using the Percus-Yevick equation, Thiele (5) has obtained, from Eqs. (1) and (2), respectively, the following two equations of state for a gas of hard spheres, i.e., molecules with a square-well potential:

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‡The lower case symbols v , s , h , c_v , c_p , and u are quantities per unit mole.

$$\frac{Pv}{RT} = \frac{1 + 2\xi_m + 3\xi_m^2}{(1 - \xi_m)^2} \quad (3)$$

and

$$\frac{Pv}{RT} = \frac{1 + \xi_m + \xi_m^2}{(1 - \xi_m)^3}, \quad (4)$$

where $\xi_m = b_m/4v$, in which $b_m = (2/3)\pi N_0 r_m^3$, is related to the volume occupied by the molecules, with r_m being the molecular radius. Thiele observes that Eq. (4) gives a somewhat better result than Eq. (3). The "exact," machine-calculated results lie between the two. Both equations fail near the density of close packing, since no phase transition is predicted.

Rowlinson has extended Thiele's work to the case of a compressible molecule by replacing the square-well potential with the Lennard-Jones [$n/2, n$] potential:

$$\varphi(r) = \epsilon \left[\left(\frac{r_m}{r} \right)^n - 2 \left(\frac{r_m}{r} \right)^{n/2} \right], \quad (5)$$

where $-\epsilon$ is the minimum value of φ at $r = r_m$. Rowlinson chooses to solve Eq. (2), since according to Thiele it leads to better results than Eq. (1), by equating the integrals with the square-well potential to those with the Lennard-Jones potential on the assumption that the temperature is sufficiently high, i.e., $T > 12\epsilon/k$. The equations will then define σ_κ , the equivalent nondimensionalized, hard-sphere radius, and will have the form

$$\int_0^{\sigma_\kappa} (-1) \rho^{\kappa-1} d\rho = \int_0^\infty \left[e^{-\varphi(\rho)/kT} - 1 \right] \rho^{\kappa-1} d\rho, \quad (6)$$

where $\rho = r/r_m$ and κ is an exponent in the range $0 < \kappa < n/2$. Rowlinson has shown that if a suitable expansion of the right side of Eq. (6) is made with the variable $x = \epsilon/kT$ and if terms greater than the order $1/n$ are neglected, then σ_κ is independent of κ and is given by

$$\sigma = \frac{r}{r_m} = x^{1/n} \left[1 + \frac{1}{n} F(x) \right], \quad (7)$$

where

$$F(x) = \gamma_e - 2\sqrt{\pi x} \sum_{l=0}^{\infty} \frac{x^l}{(2l+1)l!} - \sum_{m=1}^{\infty} \frac{(m-1)! 2^{2m} x^m}{(2m)!} \quad (8)$$

in which γ_e is Euler's constant. The fixed radius of a rigid sphere can now be replaced by the variable radius $r = r_m \sigma$, so that b can be substituted for b_m and ξ for ξ_m ; therefore,

$$\xi = \frac{b}{4v} = \frac{1}{4v} \left(\frac{2}{3} \pi N_0 r^3 \right) = \frac{1}{4v} \left(\frac{2}{3} \pi N_0 r_m^3 \sigma^3 \right).$$

Since $(2/3)\pi N_0 r_m^3 = b_m$ and using Eq. (7) to eliminate σ , then

$$\xi = \frac{b_m}{4v} x^{3/n} \left[1 + \frac{1}{n} F(x) \right]^3. \quad (9)$$

The equation of state is given either by Eq. (3) or (4) with ξ_m replaced by ξ .

Choosing n as 12 gives the usual Lennard-Jones [6, 12] potential and

$$\xi = \frac{b_m}{4v} x^{1/4} \left[1 + \frac{1}{12} F(x) \right]^3. \quad (10)$$

By specifying the equation of state of a gas, the various thermodynamic properties are specified. Commonly used thermodynamic relationships involve the derivatives of these properties with respect to the state variables (P, v, T), however, and must therefore be integrated. For an equation of state such as Eq. (3) or (4), these integrals would be difficult or even impossible to solve analytically.

A more satisfactory approach was found through the use of statistical thermodynamics which related all properties, including the equation of state, to derivatives of a total partition function Q . The relationship for the equation of state is

$$\frac{Pv}{RT} = v \left(\frac{\partial}{\partial v} \ln Q \right)_{T, N_0}. \quad (11)$$

By substituting either Eq. (3) or (4) for Pv/RT , Eq. (11) can be integrated to yield an analytic expression for those terms of the partition function which depend on v . From this result, the contribution of the intermolecular forces to the thermodynamic properties of interest can be determined (see Appendix A).

THE PARTITION FUNCTION

The total partition function is composed of factors, each of which is associated with a particular type of energy of the gas molecule. To construct the total partition function, the appropriate component partition functions corresponding to independent energy modes are simply multiplied together. In this way the equations are easily altered for different types of molecules (e.g., monatomic and diatomic) or to account for phenomena at different energies of interest (e.g., rotation-vibration or electronic excitations). For a diatomic gas between 500°K and 3000°K and between 1 amagat and 2000 amagats, the total partition function is composed of the following energy-related factors (dissociation and ionization are considered to be negligible in this range):

translational:

$$Q_t = \frac{v}{h^3} (2\pi mkT)^{3/2} \quad (12)$$

potential:

$$Q_p = (1 - \xi) e^{-3\xi(2-\xi)/2(1-\xi)^2} \quad (13)$$

rotational - vibrational:

$$Q_{rv} = \sum_{n=0}^{n_{\max}} \left(\sum_{j \text{ (even)}} (2j+1) e^{-\epsilon_j n/kT} + 3 \sum_{j \text{ (odd)}} (2j+1) e^{-\epsilon_j k/kT} \right) \quad (14)$$

where Q_t is the usual partition-function term for an ideal gas; Q_p is the factor due to the intermolecular forces as obtained by integrating Eq. (11), with Eq. (4) as the equation of state, i.e., for $Pv/RT = (1 + \xi + \xi^2)/(1 - \xi)^3$; Q_{rv} is the standard quantum mechanical term for rotation-vibration effects including that of para-hydrogen and ortho-hydrogen; ϵ_{jn} is the energy level of the molecule and includes both anharmonicity in the vibration and rotation-vibration interaction; ϵ_{jn}/k is given by

$$\left(n + \frac{1}{2} \right) \left\{ 1 - \left(n + \frac{1}{2} \right) \left[x_e - \left(n + \frac{1}{2} \right) y_e \right] \right\} \theta_{v_e} - \left(n + \frac{1}{2} \right) j(j+1) \alpha'_e \\ + (j+1) [B'_e - (j+1)(D'_e - (j+1)H'_e)] ,$$

where θ_{v_e} , α'_e , B'_e , D'_e , and H'_e are the usual constants characteristic of the gas multiplied by hc/k ; and n_{max} is the quantum number of the maximum vibrational energy level due to dissociation. The total partition function for N_0 in distinguishable particles is $Q_{tot} = Q_{N_0}^N / N_0!$ where $Q = Q_t Q_p Q_{rv}$.

THERMODYNAMIC FUNCTIONS

Having specified the total partition function, it is now possible to obtain any thermodynamic function using fundamental statistical thermodynamic relationships. Those functions of particular interest are the compressibility, the specific internal energy, the specific enthalpy, the specific entropy, the specific heat capacities at constant volume and pressure, and the sound speed. They are given, respectively, by the following equations:

$$\frac{Pv}{RT} = v \left(\frac{\partial}{\partial v} \ln Q \right)_T = Z , \quad (15)$$

$$\frac{u}{RT} = \left(\frac{\partial \ln Q}{\partial \ln T} \right)_v = \frac{3}{2} + \phi(Z-1) + DQ_{rv} , \quad (16)$$

$$\frac{h}{RT} = \frac{u}{RT} + \frac{Pv}{RT} = \frac{u}{RT} + Z , \quad (17)$$

$$\frac{s}{R} = \frac{u}{RT} + \ln \frac{Q}{N_0} + 1 . \quad (18)$$

$$\frac{c_v}{R} = \frac{1}{R} \left(\frac{\partial u}{\partial T} \right)_v = \frac{3}{2} + \phi(Z-1) \left(1 + D\phi - \frac{\phi ZZ'}{Z-1} \right) - DQ_{rv} (2 - DQ_{rv}) + D^2 Q_{rv} , \quad (19)$$

$$\frac{c_p}{R} = \frac{c_v}{R} + \frac{1}{R} \left[P + \left(\frac{\partial u}{\partial v} \right)_T \right] \left(\frac{\partial v}{\partial T} \right)_p = \frac{c_v}{R} + \frac{Z(1-\phi Z')^2}{(1+Z')} , \quad (20)$$

$$\alpha^2 = - \frac{v^2}{m} \left(\frac{\partial P}{\partial v} \right)_s = -\gamma \frac{v^2}{m} \left(\frac{\partial P}{\partial v} \right)_T = Z(1+Z') \left(\frac{\gamma RT}{m} \right) , \quad (21)$$

where

$$\phi = \frac{1}{4} \left[1 + \frac{x}{\left(1 + \frac{F}{12} \right)} \frac{dF}{dx} \right] , \quad (22)$$

$$Z' = \frac{\xi}{Z} \left(\frac{dZ}{d\xi} \right), \quad (23)$$

and D and D^2 are operators defined by

$$Df = \frac{T}{f} \left(\frac{df}{dT} \right) \text{ and } D^2f = \frac{T^2}{f} \left(\frac{d^2f}{dT^2} \right). \quad (24)$$

HYDROGEN PROPERTIES

The following properties of hydrogen gas, using Eq. (4) for the equation of state as suggested by Rowlinson, have been evaluated as a function of density ($1 \leq \rho \leq 2000$ amagats) and temperature ($500^\circ\text{K} \leq T \leq 3000^\circ\text{K}$): pressure P , compressibility Z , specific heat capacities at constant volume c_v and constant pressure c_p , sound speed a , specific internal energy u , specific enthalpy h , and specific entropy s . The latter three quantities are presented as relative to their values at $\rho = 1$ amagat and $T = 273.16^\circ\text{K}$, which are denoted as u_0 , h_0 , and s_0 , respectively.

The upper limit on density has been selected so as not to approach too closely the close-packing density given by $\xi_{\max} = \pi\sqrt{2}/6 = 0.74$ (Ref. 5). For $500^\circ\text{K} \leq T \leq 3000^\circ\text{K}$, this would mean that $3300 \leq \rho_{\max} \leq 4300$ amagats. The upper limit on temperature has been selected so as to avoid any significant molecular dissociation, and the lower limit on temperature is set by the approximation in the theory that $T > n\epsilon/k \approx 450^\circ\text{K}$. Table 1 is a listing of the constants used in the calculations and their sources. The properties of hydrogen are presented in Tables 2 and 3. The temperature and density intervals in these two tables have been chosen so that the error using linear interpolation will be less than 0.1% in almost all cases, with the exception of relative entropy in the vicinity of zero.

A comparison of these results (6) with other published equation of state data for hydrogen (7), (8), (9) shows close agreement. Divergences appear only at the higher end of the density range. For the purpose of this comparison, a value of $S_0/R = 16.866$ from Ref. 7 was used with Ref. 9 and a value of $S_0/R = 15.402$ was used with Ref. 8.

Table 4 gives a breakdown of the contribution to u , h , s , c_v , and c_p from each of the three factors in the partition function. In particular the contribution from the intermolecular potential shows the extent of the deviation from an ideal gas.

Selected graphs of the data from Tables 2 and 3 are presented in Figs. 1 through 7 and in Appendix B. The constant entropy data was calculated using Eq. (18) from which the entropy s_1 for any gas state may be calculated. Any other state s_2 with the same entropy may be obtained by specifying one of the state variables and iterating Eq. (18) for the other state variable until $s_1 = s_2$.

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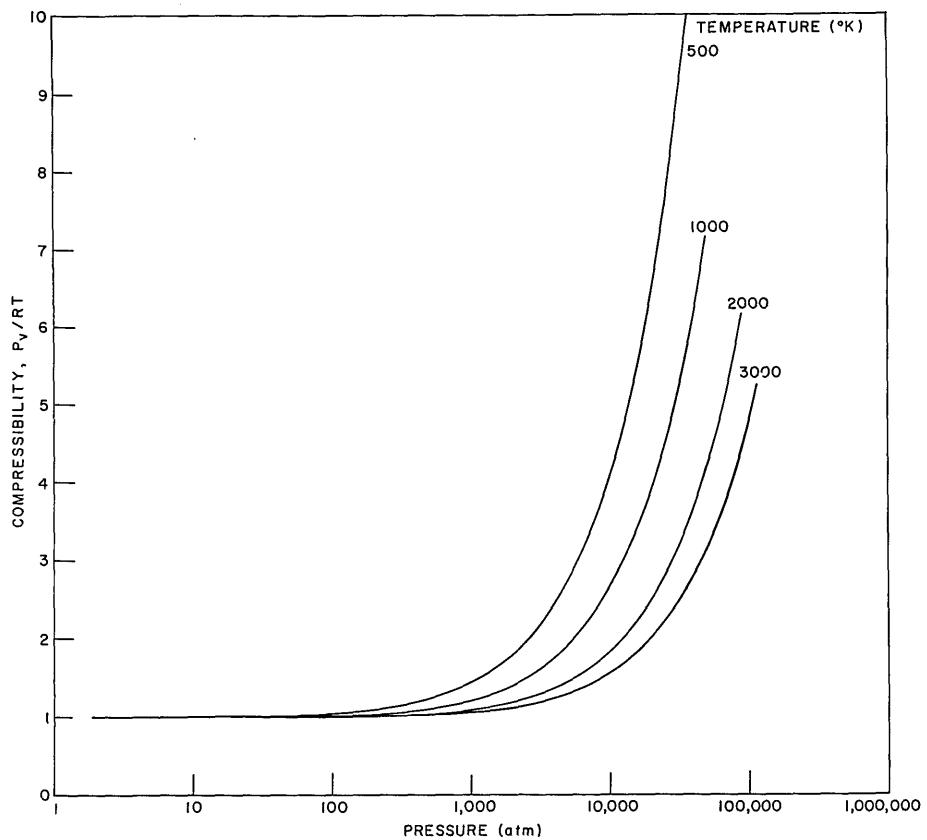


Fig. 1 - Compressibility vs pressure for constant temperature

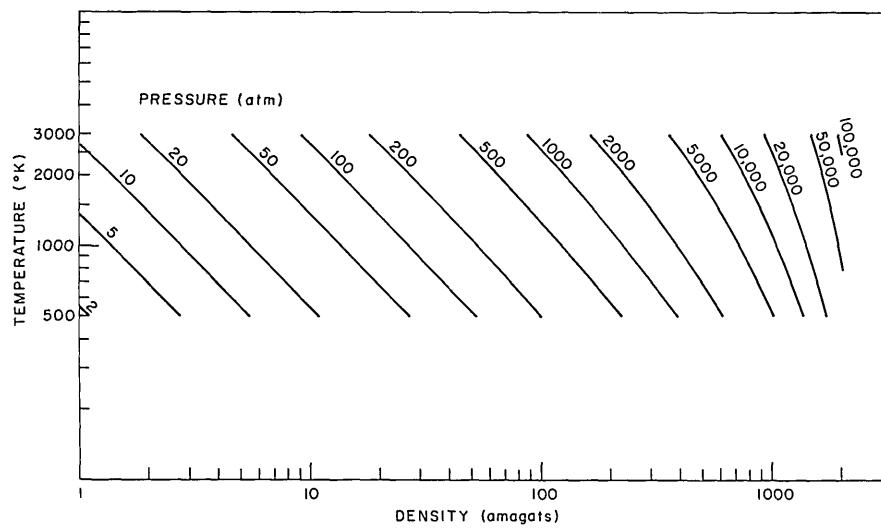


Fig. 2 - Temperature vs density for constant pressure

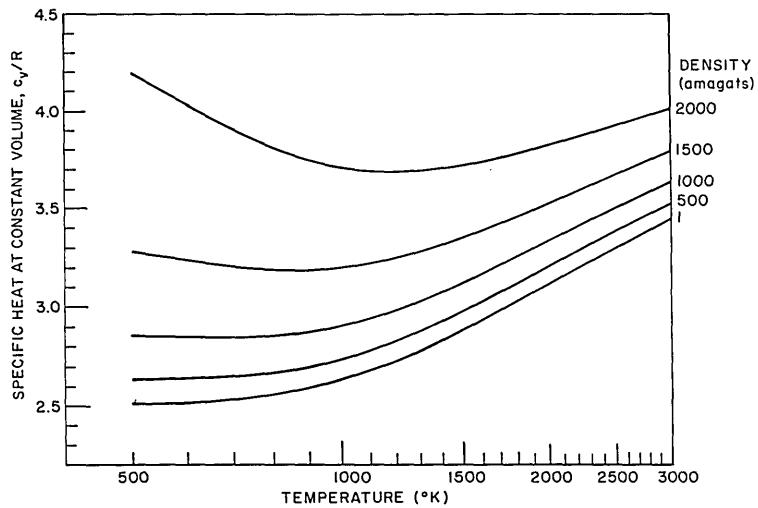


Fig. 3 - Specific heat at constant volume
vs temperature for constant density

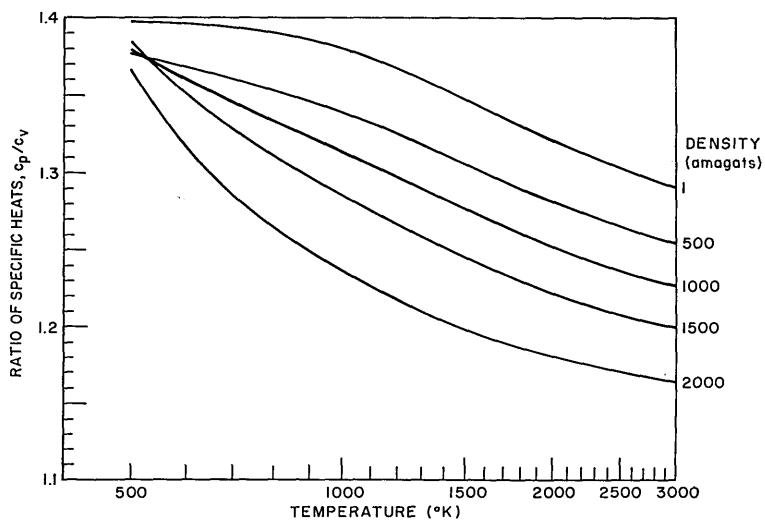


Fig. 4 - Ratio of specific heats vs temperature for constant density

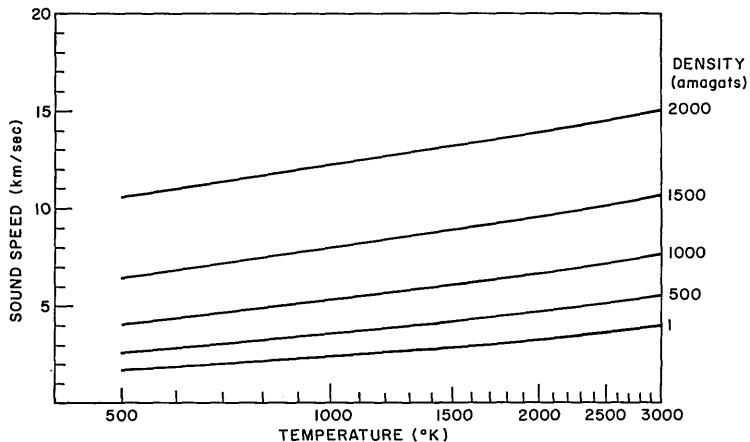


Fig. 5 - Sound speed vs temperature for constant density

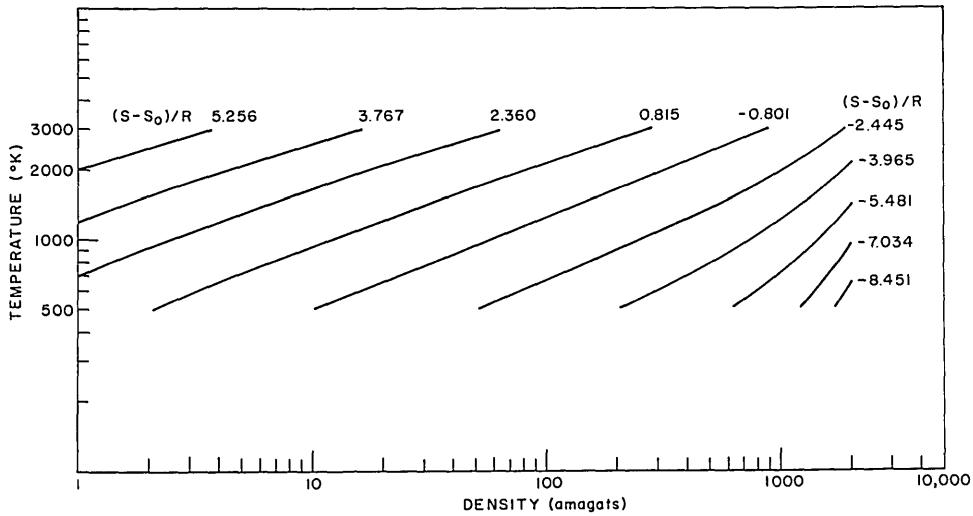


Fig. 6 - Temperature vs density for constant entropy

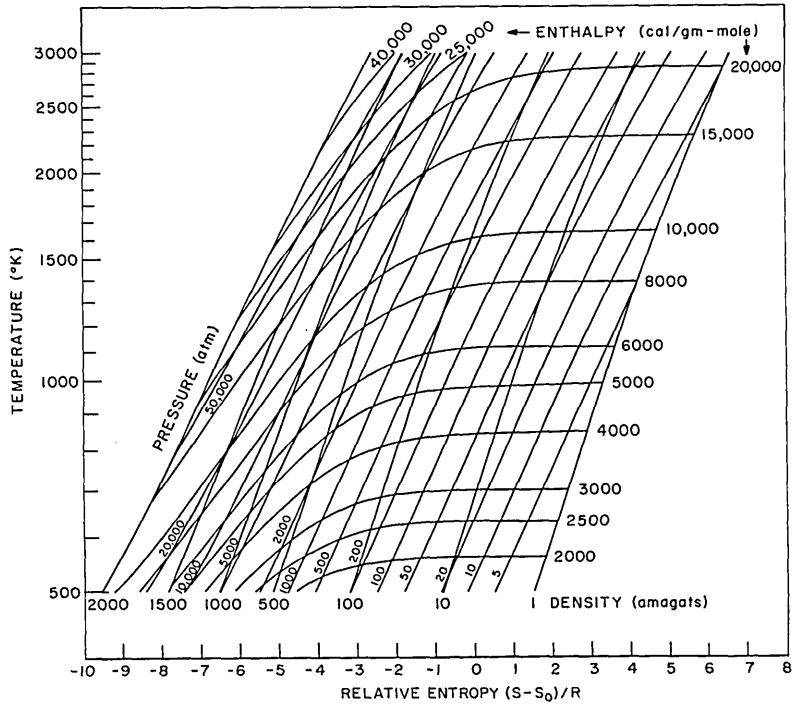


Fig. 7 - Temperature vs relative entropy for constant pressure, density, and enthalpy

Table 1
Hydrogen Constants

Constant	Value	Ref.	Page
R	0.8317×10^{-2} joules/ $^{\circ}\text{K}/\text{kg-mole}$ or 1.9869 cal/ $^{\circ}\text{K}/\text{g-mole}$	10	3437
m	2.016 kg/kg-mole	10	582
N_0	6.0248×10^{23} /mole	10	3437
r_0	2.928×10^{-8} cm	11	1110
$r_m = 2^{1/6} r_0$	3.287×10^{-8} cm	—	—
$b_m = (2/3) \pi N_0 r_m^3$	44.795 cm 3	—	—
ϵ/k	37°K	11	1110
γ_e	0.577215665	10	12
θ_{ve}	6315.5°K	12	468
α_e	$3.0664/\text{cm}$	14	352
B_e	$60.848/\text{cm}$	14	352
D_e	$0.04644/\text{cm}$	14	352
H_e	$0.0000497/\text{cm}$	13	109
$\alpha'_e = hc\alpha_e/k$	4.411°K	—	—
$B'_e = hcB_e/k$	87.54°K	—	—
$D'_e = hcD_e/k$	0.06681°K	—	—
$H'_e = hcH_e/k$	$0.0000715^{\circ}\text{K}$	—	—
n_{\max}	14	—	—
x_e	0.02603	12	468
y_e	0.0000667	13	532
hc/k	1.4388 cm $^{-1}$ $^{\circ}\text{K}$	10	3437

Table 2
Selected Properties of Hydrogen

TEMPERATURE (DEGREES K)		DENSITY (AMAGAT)									
		1.	10.	20.	30.	40.	50.	100.	150.	200.	250.
500.	P(ATM)	1.8310	18.459	37.254	56.390	75.873	95.709	200.40	314.86	439.96	576.64
	Z	1.0009	1.0091	1.0182	1.0275	1.0369	1.0464	1.0955	1.1474	1.2025	1.2609
	CV/R	2.5196	2.5212	2.5231	2.5249	2.5268	2.5287	2.5384	2.5487	2.5596	2.5712
	C ^o /R	3.5195	3.5200	3.5205	3.5212	3.5220	3.5228	3.5279	3.5349	3.5437	3.5543
	CP/CV	1.3968	1.3961	1.3953	1.3946	1.3939	1.3931	1.3898	1.3869	1.3845	1.3824
	A(KPS)	1.6987	1.7121	1.7271	1.7422	1.7575	1.7729	1.8518	1.9341	2.0200	2.1097
600.	P(ATM)	2.1972	22.148	44.692	67.640	90.997	114.77	240.14	377.02	526.43	689.46
	Z	1.0009	1.0089	1.0180	1.0271	1.0363	1.0456	1.0939	1.1450	1.1990	1.2563
	CV/R	2.5277	2.5293	2.5310	2.5328	2.5347	2.5365	2.5460	2.5560	2.5665	2.5777
	C ^o /R	3.5275	3.5276	3.5278	3.5280	3.5283	3.5287	3.5316	3.5363	3.5426	3.5505
	CP/CV	1.3956	1.3947	1.3938	1.3929	1.3920	1.3912	1.3871	1.3835	1.3803	1.3774
	A(KPS)	1.8600	1.8743	1.8904	1.9066	1.9229	1.9394	2.0238	2.1118	2.2035	2.2991
700.	P(ATM)	2.5633	25.836	52.126	78.880	106.10	133.80	279.76	438.91	612.37	801.39
	Z	1.0009	1.0088	1.0177	1.0266	1.0357	1.0449	1.0924	1.1425	1.1955	1.2517
	CV/R	2.5414	2.5429	2.5446	2.5464	2.5482	2.5500	2.5592	2.5689	2.5792	2.5899
	C ^o /R	3.5412	3.5410	3.5409	3.5408	3.5408	3.5409	3.5422	3.5451	3.5496	3.5557
	CP/CV	1.3934	1.3925	1.3915	1.3905	1.3895	1.3886	1.3841	1.3800	1.3763	1.3729
	A(KPS)	2.0074	2.0226	2.0396	2.0567	2.0740	2.0914	2.1805	2.2733	2.3700	2.4707
800.	P(ATM)	2.9295	29.523	59.557	90.111	121.19	152.81	319.28	500.55	697.87	912.60
	Z	1.0009	1.0086	1.0174	1.0262	1.0352	1.0442	1.0908	1.1401	1.1922	1.2472
	CV/R	2.5634	2.5649	2.5666	2.5683	2.5700	2.5718	2.5808	2.5903	2.6002	2.6107
	C ^o /R	3.5631	3.5628	3.5624	3.5621	3.5619	3.5618	3.5619	3.5636	3.5667	3.5713
	CP/CV	1.3900	1.3891	1.3880	1.3870	1.3860	1.3849	1.3802	1.3758	1.3717	1.3679
	A(KPS)	2.1434	2.1593	2.1771	2.1950	2.2131	2.2313	2.3246	2.4217	2.5227	2.6278
900.	P(ATM)	3.2956	33.209	66.984	101.34	136.27	171.80	358.72	562.00	783.00	1023.2
	Z	1.0008	1.0085	1.0171	1.0258	1.0346	1.0435	1.0894	1.1378	1.1890	1.2429
	CV/R	2.5943	2.5958	2.5974	2.5991	2.6008	2.6025	2.6113	2.6206	2.6303	2.6406
	C ^o /R	3.5941	3.5935	3.5930	3.5926	3.5922	3.5918	3.5910	3.5917	3.5938	3.5973
	CP/CV	1.3854	1.3844	1.3833	1.3822	1.3812	1.3801	1.3752	1.3706	1.3663	1.3623
	A(KPS)	2.2096	2.2801	2.3046	2.3233	2.3421	2.3610	2.4580	2.5588	2.6637	2.7727
1000.	P(ATM)	3.6617	36.894	74.409	112.55	151.34	190.78	398.08	623.27	867.80	1133.3
	Z	1.0008	1.0084	1.0169	1.0255	1.0341	1.0429	1.0881	1.1357	1.1859	1.2390
	CV/R	2.6332	2.6347	2.6363	2.6379	2.6396	2.6413	2.6499	2.6590	2.6685	2.6785
	C ^o /R	3.6330	3.6323	3.6317	3.6311	3.6305	3.6301	3.6286	3.6284	3.6297	3.6322
	CP/CV	1.3797	1.3787	1.3776	1.3765	1.3754	1.3744	1.3693	1.3646	1.3662	1.3561
	A(KPS)	2.3874	2.4045	2.4237	2.4430	2.4624	2.4820	2.5823	2.6865	2.7948	2.9074
1200.	P(ATM)	4.3940	44.263	89.251	134.97	181.45	228.68	476.62	745.37	1036.6	1352.0
	Z	1.0008	1.0082	1.0164	1.0248	1.0332	1.0417	1.0856	1.1318	1.1805	1.2318
	CV/R	2.7277	2.7291	2.7307	2.7323	2.7339	2.7355	2.7439	2.7526	2.7617	2.7713
	C ^o /R	3.7274	3.7266	3.7258	3.7250	3.7243	3.7236	3.7210	3.7197	3.7196	3.7208
	CP/CV	1.3665	1.3655	1.3644	1.3633	1.3623	1.3612	1.3561	1.3513	1.3469	1.3426
	A(KPS)	2.6027	2.6208	2.6411	2.6616	2.6822	2.7029	2.8090	2.9191	3.0333	3.1519
1400.	P(ATM)	5.1262	51.630	104.08	157.38	211.52	266.53	554.95	866.98	1204.4	1569.3
	Z	1.0008	1.0080	1.0160	1.0242	1.0324	1.0407	1.0834	1.1284	1.1757	1.2255
	CV/R	2.8320	2.8333	2.8349	2.8364	2.8380	2.8396	2.8477	2.8561	2.8649	2.8742
	C ^o /R	3.8317	3.8308	3.8298	3.8289	3.8280	3.8272	3.8238	3.8217	3.8208	3.8210
	CP/CV	1.3530	1.3520	1.3510	1.3499	1.3488	1.3478	1.3428	1.3381	1.3336	1.3294
	A(KPS)	2.7972	2.8163	2.8375	2.8590	2.8805	2.9023	3.0133	3.1284	3.2477	3.3715
1600.	P(ATM)	5.8584	58.995	118.91	179.77	241.57	304.33	633.11	988.18	1371.5	1785.3
	Z	1.0008	1.0078	1.0157	1.0236	1.0317	1.0398	1.0815	1.1254	1.1715	1.2199
	CV/R	2.9353	2.9366	2.9381	2.9396	2.9412	2.9427	2.9506	2.9588	2.9674	2.9763
	C ^o /R	3.9350	3.9340	3.9329	3.9319	3.9310	3.9300	3.9261	3.9234	3.9218	3.9212
	CP/CV	1.3406	1.3396	1.3386	1.3376	1.3365	1.3355	1.3306	1.3260	1.3216	1.3175
	A(KPS)	2.9766	2.9964	3.0185	3.0408	3.0632	3.0858	3.2012	3.3207	3.4445	3.5728
1800.	P(ATM)	6.5906	66.359	133.73	202.14	271.59	342.11	711.12	1109.0	1538.0	2000.3
	Z	1.0008	1.0076	1.0154	1.0231	1.0310	1.0389	1.0798	1.1227	1.1677	1.2149
	CV/R	3.0320	3.0333	3.0348	3.0363	3.0378	3.0393	3.0469	3.0549	3.0633	3.0720
	C ^o /R	4.0317	4.0307	4.0295	4.0284	4.0274	4.0264	4.0221	4.0189	4.0167	4.0156
	CP/CV	1.3297	1.3288	1.3278	1.3268	1.3258	1.3248	1.3200	1.3155	1.3113	1.3072
	A(KPS)	3.1443	3.1647	3.1876	3.2107	3.2339	3.2573	3.3766	3.5001	3.6279	3.7603
2000.	P(ATM)	7.3228	73.722	148.55	224.51	301.60	379.85	789.00	1229.6	1703.9	2214.4
	Z	1.0007	1.0075	1.0151	1.0227	1.0304	1.0382	1.0783	1.1202	1.1643	1.2105
	CV/R	3.1200	3.1213	3.1227	3.1241	3.1256	3.1271	3.1346	3.1424	3.1505	3.1590
	C ^o /R	4.1197	4.1186	4.1174	4.1163	4.1151	4.1141	4.1095	4.1059	4.1033	4.1017
	CP/CV	1.3204	1.3195	1.3185	1.3176	1.3166	1.3156	1.3110	1.3066	1.3024	1.2984
	A(KPS)	3.3027	3.3238	3.3474	3.3712	3.3951	3.4192	3.5421	3.6693	3.8007	3.9368
2500.	P(ATM)	9.1532	92.125	185.58	280.38	376.54	474.09	983.24	1529.9	2116.6	2746.3
	Z	1.0007	1.0072	1.0145	1.0218	1.0292	1.0366	1.0750	1.1151	1.1570	1.2010
	CV/R	3.3019	3.3032	3.3045	3.3059	3.3073	3.3087	3.3159	3.3233	3.3310	3.3390
	C ^o /R	4.3017	4.3005	4.2992	4.2980	4.2968	4.2956	4.2904	4.2862	4.2829	4.2805
	CP/CV	1.3028	1.3019	1.3010	1.3001	1.2992	1.2983	1.2939	1.2897	1.2858	1.2820
	A(KPS)	3.6676	3.6901	3.7153	3.7407	3.7662	3.7918	3.9226	4.0577	4.1972	4.3413
3000.	P(ATM)	10.984	110.52	222.58	336.20	451.40	566.20	1176.9	1828.9	2527.1	3274.5
	Z	1.0007	1.0069	1.0140	1.0210	1.0282	1.0354	1.0723	1.1109	1.1512	1.1933
	CV/R	3.4410	3.4421	3.4435	3.4448	3.4461	3.4475	3.4544	3.4615	3.4689	3.4766
	C ^o /R	4.4407	4.4395	4.4381	4.4368	4.4356	4.4344	4.4289	4.4243	4.4205	4.4176
	CP/CV	1.2905	1.2897	1.2889	1.2880	1.2871	1.2863	1.2821	1.2781	1.2743	1.2707
	A(KPS)	3.9987	4.0224	4.0489	4.0756	4.1024	4.1294	4.2669	4.4088	4.5551	4.7061

(Table continues)

Table 2 (Continued)

TEMPERATURE (DEGREE K)	DENSITY (AMAGAT)										
	300.	350.	400.	450.	500.	600.	700.	800.	900.	1000.	
500.	P(ATM)	725.94	888.98	1067.6	1261.3	1473.5	1957.8	2534.9	3222.7	4043.2	5022.7
	Z	1.3228	1.3884	1.4582	1.5322	1.6109	1.7837	1.9795	2.2021	2.4557	2.7457
	CV/R	2.5834	2.5963	2.6100	2.6246	2.6400	2.6738	2.7119	2.7551	2.8041	2.8598
	CP/R	3.5666	3.5807	3.5966	3.6144	3.6340	3.6789	3.7319	3.7934	3.8644	3.9456
	CP/CV	1.3806	1.3791	1.3786	1.3771	1.3765	1.3759	1.3761	1.3769	1.3781	1.3796
	A(KPS)	2.2033	2.3012	2.4035	2.5104	2.6222	2.8616	3.1240	3.4122	3.7291	4.0781
600.	P(ATM)	867.29	1061.2	1272.7	1503.3	1754.6	2327.3	3007.8	3816.8	4779.0	5924.5
	Z	1.3169	1.3812	1.4494	1.5218	1.5986	1.7670	1.9574	2.1734	2.4189	2.6988
	CV/R	2.5894	2.6019	2.6151	2.6290	2.6437	2.6759	2.7120	2.7527	2.7986	2.8506
	CP/R	3.5601	3.5712	3.5841	3.5985	3.6146	3.6519	3.6962	3.7478	3.8074	3.8755
	CP/CV	1.3748	1.3726	1.3705	1.3688	1.3672	1.3647	1.3629	1.3615	1.3604	1.3595
	A(KPS)	2.3989	2.5030	2.6117	2.7252	2.8437	3.0970	3.3740	3.6772	4.0096	4.3747
700.	P(ATM)	1007.3	1231.6	1475.8	1741.7	2031.1	2689.3	3469.3	4393.9	5490.5	6792.3
	Z	1.3110	1.3739	1.4406	1.5112	1.5862	1.7501	1.9352	2.1445	2.3820	2.6521
	CV/R	2.6013	2.6133	2.6260	2.6394	2.6535	2.6843	2.7187	2.7572	2.8005	2.8492
	CP/R	3.5632	3.5723	3.5828	3.5949	3.6084	3.6400	3.6779	3.7223	3.7736	3.8322
	CP/CV	1.3698	1.3669	1.3643	1.3620	1.3598	1.3561	1.3528	1.3500	1.3475	1.3450
	A(KPS)	2.6657	2.6652	2.7993	2.9183	3.0425	3.3074	3.5963	3.9120	4.2571	4.6352
800.	P(ATM)	1146.2	1400.3	1676.7	1977.1	2303.8	3045.2	3921.4	4957.2	6182.5	7632.9
	Z	1.3054	1.3669	1.4321	1.5011	1.5742	1.7340	1.9139	2.1171	2.3470	2.6078
	CV/R	2.6218	2.6334	2.6456	2.6586	2.6722	2.7017	2.7345	2.7712	2.8122	2.8581
	CP/R	3.5773	3.5847	3.5935	3.6037	3.6153	3.6426	3.6756	3.7144	3.7593	3.8107
	CP/CV	1.3645	1.3613	1.3583	1.3555	1.3529	1.3483	1.3442	1.3404	1.3368	1.3333
	A(KPS)	2.7373	2.8513	2.9701	3.0939	3.2229	3.4978	3.7970	4.1231	4.4790	4.8680
900.	P(ATM)	1284.2	1567.7	1875.7	2210.1	2573.3	3395.9	4365.6	5509.2	6858.4	8451.2
	Z	1.3000	1.3603	1.4241	1.4916	1.5630	1.7188	1.8940	2.0914	2.3143	2.5666
	CV/R	2.6513	2.6626	2.6745	2.6870	2.7001	2.7285	2.7601	2.7951	2.8342	2.8777
	CP/R	3.6021	3.6082	3.6156	3.6244	3.6344	3.6583	3.6874	3.7218	3.7617	3.8073
	CP/CV	1.3586	1.3551	1.3519	1.3489	1.3460	1.3408	1.3360	1.3315	1.3273	1.3230
	A(KPS)	2.8862	3.0043	3.1272	3.2551	3.3884	3.6719	3.9800	4.3151	4.6802	5.0784
1000.	P(ATM)	1421.4	1734.0	2073.1	2441.0	2840.1	3742.2	4803.3	6051.5	7520.6	9250.7
	Z	1.2950	1.3541	1.4166	1.4826	1.5525	1.7047	1.8755	2.0675	2.2839	2.5284
	CV/R	2.6890	2.7000	2.7115	2.7236	2.7364	2.7638	2.7942	2.8279	2.8653	2.9068
	CP/R	3.6361	3.6412	3.6475	3.6550	3.6638	3.6849	3.7109	3.7417	3.7776	3.8186
	CP/CV	1.3522	1.3486	1.3452	1.3420	1.3389	1.3333	1.3280	1.3231	1.3184	1.3137
	A(KPS)	3.0244	3.1460	3.2726	3.4043	3.5413	3.8325	4.1484	4.4915	4.8645	5.2708
1200.	P(ATM)	1693.7	2063.6	2464.0	2897.5	3366.6	4423.9	5662.0	7112.3	8811.5	10804.
	Z	1.2859	1.3429	1.4031	1.4666	1.5336	1.6794	1.8423	2.0249	2.2300	2.4608
	CV/R	2.7613	2.7918	2.8026	2.8143	2.8263	2.8522	2.8807	2.9121	2.9467	2.9848
	CP/R	3.7232	3.7267	3.7313	3.7371	3.7439	3.7608	3.7820	3.8074	3.8371	3.8711
	CP/CV	1.3386	1.3349	1.3313	1.3279	1.3246	1.3185	1.3129	1.3074	1.3022	1.2969
	A(KPS)	3.2750	3.4029	3.5358	3.6739	3.8173	4.1216	4.4508	4.8073	5.1938	5.6134
1400.	P(ATM)	1963.7	2389.9	2850.5	3348.1	3885.6	5093.5	6502.8	8147.1	10066.	12307.
	Z	1.2779	1.3331	1.3913	1.4526	1.5172	1.6574	1.8136	1.9882	2.1836	2.4028
	CV/R	2.8838	2.8939	2.9044	2.9154	2.9269	2.9515	2.9785	3.0080	3.0404	3.0760
	CP/R	3.8223	3.8246	3.8280	3.8324	3.8379	3.8517	3.8693	3.8908	3.9160	3.9451
	CP/CV	1.3254	1.3216	1.3180	1.3146	1.3112	1.3050	1.2991	1.2935	1.2880	1.2825
	A(KPS)	3.4998	3.6330	3.7712	3.9146	4.0635	4.3787	4.7190	5.0866	5.4843	5.9149
1600.	P(ATM)	2231.8	2713.6	3233.3	3793.9	4398.4	5753.4	7329.0	9161.1	11292.	13772.
	Z	1.2709	1.3245	1.3808	1.4402	1.5027	1.6381	1.7886	1.9562	2.1433	2.3526
	CV/R	2.9856	2.9953	3.0055	3.0160	3.0271	3.0507	3.0764	3.1044	3.1351	3.1686
	CP/R	3.9217	3.9232	3.9257	3.9291	3.9335	3.9449	3.9599	3.9783	4.0002	4.0254
	CP/CV	1.3135	1.3098	1.3062	1.3027	1.2994	1.2931	1.2872	1.2815	1.2760	1.2704
	A(KPS)	3.7057	3.8435	3.9863	4.1345	4.2881	4.6128	4.9627	5.3399	5.7471	6.1871
1800.	P(ATM)	2498.4	3035.1	3613.1	4235.7	4906.1	6405.2	8143.1	10158.	12494.	15204.
	Z	1.2646	1.3168	1.3716	1.4293	1.4899	1.6210	1.7664	1.9280	2.1080	2.3087
	CV/R	3.0810	3.0904	3.1002	3.1105	3.1211	3.1438	3.1684	3.1953	3.2245	3.2562
	CP/R	4.0155	4.0163	4.0186	4.0207	4.0242	4.0338	4.0466	4.0627	4.0819	4.1042
	CP/CV	1.3033	1.2996	1.2960	1.2926	1.2893	1.2831	1.2772	1.2715	1.2659	1.2604
	A(KPS)	3.8973	4.0392	4.1862	4.3385	4.4963	4.8296	5.1879	5.5736	5.9892	6.4374
2000.	P(ATM)	2763.7	3394.6	3990.3	4674.0	5409.3	7050.1	8947.0	11140.	13676.	16609.
	Z	1.2590	1.3099	1.3533	1.4195	1.4785	1.6058	1.7467	1.9030	2.0766	2.2699
	CV/R	3.1678	3.1770	3.1865	3.1964	3.2067	3.2286	3.2524	3.2782	3.3061	3.3364
	CP/R	4.1011	4.1014	4.1025	4.1045	4.1073	4.1154	4.1266	4.1407	4.1578	4.1777
	CP/CV	1.2946	1.2910	1.2875	1.2841	1.2809	1.2747	1.2688	1.2631	1.2576	1.2521
	A(KPS)	4.0775	4.2232	4.3740	4.5301	4.6917	5.0326	5.3987	5.7920	6.2152	6.6708
2500.	P(ATM)	3421.9	4146.6	4923.9	5757.5	6651.3	8637.3	10920.	13544.	16560.	20027.
	Z	1.2470	1.2953	1.3458	1.3988	1.4544	1.5739	1.7055	1.8509	2.0116	2.1896
	CV/R	3.3473	3.3560	3.3649	3.3742	3.3838	3.4042	3.4262	3.4499	3.4755	3.5030
	CP/R	4.2790	4.2782	4.2783	4.2791	4.2807	4.2860	4.2941	4.3047	4.3178	4.3334
	CP/CV	1.2783	1.2748	1.2714	1.2682	1.2650	1.2590	1.2533	1.2478	1.2424	1.2370
	A(KPS)	4.4902	4.6440	4.8031	4.9674	5.1374	5.4949	5.8776	6.2875	6.7269	7.1984
3000.	P(ATM)	4074.4	4930.6	5846.7	6826.8	7875.3	10196.	12852.	15889.	19364.	23340.
	Z	1.2374	1.2835	1.3317	1.3822	1.4350	1.5483	1.6727	1.8095	1.9602	2.1264
	CV/R	3.4845	3.4927	3.5012	3.5100	3.5191	3.5384	3.5590	3.5811	3.6049	3.6305
	CP/R	4.4154	4.4140	4.4134	4.4141	4.4176	4.4235	4.4317	4.4422	4.4548	
	CP/CV	1.2672	1.2638	1.2605	1.2574	1.2543	1.2485	1.2429	1.2375	1.2323	1.2271
	A(KPS)	4.8620	5.0228	5.1888	5.3602	5.5372	5.9088	6.3055	6.7293	7.1823	7.6672

(Table continues)

Table 2 (Continued)

TEMPERATURE (DEGREE K)	DENSITY (AMAGAT)										
	1100.	1200.	1300.	1400.	1500.	1600.	1700.	1800.	1900.	2000.	
500.	P(ATM)	6193.8	7596.1	9278.6	11302.	13741.	16691.	20271.	24631.	29966.	36523.
	Z	3.0780	3.4603	3.9016	4.4129	5.0077	5.7026	6.5183	7.4804	8.6214	9.9825
	CV/R	2.9234	2.9962	3.0798	3.1761	3.2875	3.4168	3.5567	3.7441	3.9517	4.1974
	CP/R	4.0381	4.1434	4.2631	4.3991	4.5538	4.7301	4.9313	5.1618	5.4268	5.7326
	CP/CV	1.3813	1.3829	1.3842	1.3851	1.3852	1.3843	1.3823	1.3787	1.3733	1.3658
	A(KPS)	4.4633	4.8891	5.3606	5.8838	6.4654	7.1135	7.8370	8.6469	9.5557	10.578
600.	P(ATM)	7290.0	8920.1	10870.	13206.	16014.	19398.	23487.	28449.	34493.	41888.
	Z	3.0190	3.3862	3.8089	4.2972	4.8634	5.5227	6.2938	7.1998	8.2699	9.5409
	CV/R	2.9096	2.9766	3.0531	3.1406	3.2411	3.3567	3.4904	3.6455	3.8261	4.0373
	CP/R	3.9530	4.0409	4.1403	4.2525	4.3793	4.5227	4.6850	4.8691	5.0785	5.3174
	CP/CV	1.3586	1.3575	1.3561	1.3540	1.3512	1.3473	1.3422	1.3357	1.3273	1.3171
	A(KPS)	4.7763	5.2187	5.7070	6.2469	6.8449	7.5086	8.2468	9.0696	9.9891	11.020
700.	P(ATM)	8339.4	10181.	12376.	14998.	18138.	21908.	26448.	31933.	38586.	46690.
	Z	2.9602	3.3127	3.7172	4.1830	4.7215	5.3464	6.0746	6.9270	7.9297	9.1153
	CV/R	2.9041	2.9662	3.0367	3.1167	3.2079	3.3121	3.4315	3.5688	3.7271	3.9104
	CP/R	3.8987	3.9738	4.0585	4.1536	4.2604	4.3803	4.5150	4.6664	4.8369	5.0294
	CP/CV	1.3425	1.3397	1.3365	1.3327	1.3281	1.3225	1.3158	1.3076	1.2978	1.2861
	A(KPS)	5.0500	5.5057	6.0071	6.5599	7.1703	7.8455	8.5941	9.4257	10.352	11.386
800.	P(ATM)	9351.7	11391.	13815.	16702.	20147.	24268.	29214.	35166.	42355.	51075.
	Z	2.9046	3.2432	3.6308	4.0759	4.5089	5.1821	5.8711	6.6747	7.6163	8.7250
	CV/R	2.9097	2.9676	3.0329	3.1067	3.1902	3.2850	3.3928	3.5157	3.6562	3.8173
	CP/R	3.8689	3.9344	4.0080	4.0903	4.1822	4.2847	4.3991	4.5266	4.6689	4.8278
	CP/CV	1.3297	1.3258	1.3215	1.3166	1.3109	1.3043	1.2966	1.2875	1.2770	1.2647
	A(KPS)	5.2936	5.7602	6.2723	6.8353	7.4554	8.1396	8.8959	9.7337	10.664	11.699
900.	P(ATM)	10334.	12561.	15201.	18335.	22064.	26510.	31826.	38202.	45875.	55142.
	Z	2.8530	3.1790	3.5511	3.9773	4.4670	5.0318	5.6855	6.4454	7.3326	8.3731
	CV/R	2.9264	2.9808	3.0149	3.1104	3.1876	3.2746	3.3729	3.4841	3.6103	3.7537
	CP/R	3.8590	3.9171	3.9821	4.0545	4.1349	4.2242	4.3231	4.4325	4.5537	4.6878
	CP/CV	1.3187	1.3141	1.3091	1.3035	1.2972	1.2900	1.2817	1.2722	1.2613	1.2489
	A(KPS)	5.5133	5.9890	6.5099	7.0815	7.7095	8.4007	9.1629	10.005	10.938	11.973
1000.	P(ATM)	11290.	13697.	16542.	19910.	23905.	28655.	34316.	41082.	49196.	58959.
	Z	2.8053	3.1198	3.4779	3.8870	4.3559	4.8950	5.5172	6.2382	7.0771	8.0575
	CV/R	2.9529	3.0044	3.0018	3.1260	3.1979	3.2784	3.3689	3.4706	3.5851	3.7142
	CP/R	3.8650	3.9171	3.9752	4.0398	4.1112	4.1901	4.2769	4.3724	4.4773	4.5924
	CP/CV	1.3089	1.3038	1.2983	1.2923	1.2856	1.2781	1.2695	1.2598	1.2489	1.2364
	A(KPS)	5.7136	6.1971	6.7256	7.3043	7.9388	8.6358	9.4026	10.248	11.182	12.216
1200.	P(ATM)	13141.	15887.	19117.	22920.	27409.	32716.	39006.	46478.	55382.	66024.
	Z	2.7211	3.1055	3.3494	3.7290	4.1620	4.6573	5.2260	5.8813	6.6391	7.5192
	CV/R	3.0270	3.0737	3.1253	3.1826	3.2461	3.3167	3.3951	3.4823	3.5794	3.6873
	CP/R	3.9096	3.9528	4.0007	4.0536	4.1118	4.1755	4.2449	4.3204	4.4022	4.4907
	CP/CV	1.2916	1.2860	1.2801	1.2737	1.2667	1.2589	1.2503	1.2407	1.2299	1.2179
	A(KPS)	6.0695	6.5658	7.1066	7.6967	8.3416	9.0475	9.8212	10.671	11.606	12.637
1400.	P(ATM)	14927.	17990.	21578.	25785.	30727.	36543.	43400.	51506.	61111.	72527.
	Z	2.6492	2.9269	3.2405	3.5958	3.9993	4.4589	4.9842	5.5864	6.2794	7.0797
	CV/R	3.1151	3.1581	3.2054	3.2575	3.3148	3.3780	3.4477	3.5245	3.6091	3.7023
	CP/R	3.9779	4.0147	4.0554	4.1002	4.1492	4.2024	4.2600	4.3221	4.3886	4.4595
	CP/CV	1.2770	1.2712	1.2652	1.2587	1.2517	1.2440	1.2356	1.2263	1.2160	1.2045
	A(KPS)	6.3817	6.8884	7.4390	8.0381	8.6910	9.4035	10.182	11.035	11.970	12.998
1600.	P(ATM)	16660.	20025.	23951.	28537.	33903.	40190.	47572.	56258.	66502.	78616.
	Z	2.5872	2.8561	3.1473	3.4821	3.8610	4.2910	4.7804	5.3391	5.9791	6.7149
	CV/R	3.2052	3.2453	3.2891	3.3372	3.3898	3.4474	3.5105	3.5795	3.6550	3.7373
	CP/R	4.0440	4.0860	4.1214	4.1602	4.2025	4.2481	4.2972	4.3497	4.4054	4.4642
	CP/CV	1.2648	1.2591	1.2530	1.2466	1.2397	1.2323	1.2241	1.2152	1.2053	1.1945
	A(KPS)	6.6630	7.1784	7.7372	8.3439	9.0033	9.7212	10.504	11.358	12.293	13.317
1800.	P(ATM)	18350.	22004.	26253.	31199.	36965.	43696.	51569.	60795.	71631.	84389.
	Z	2.5331	2.7843	3.0664	3.3839	3.7419	4.1469	4.6062	5.1247	5.7247	6.4071
	CV/R	3.2909	3.3286	3.3697	3.4145	3.4633	3.5165	3.5744	3.6375	3.7059	3.7800
	CP/R	4.1295	4.1578	4.1890	4.2232	4.2604	4.3003	4.3431	4.3884	4.4363	4.4863
	CP/CV	1.2548	1.2491	1.2432	1.2369	1.2301	1.2229	1.2150	1.2065	1.1971	1.1868
	A(KPS)	6.9213	7.4444	8.0103	8.6234	9.2885	10.011	10.797	11.653	12.586	13.607
2000.	P(ATM)	20005.	23937.	28495.	33786.	39932.	47085.	55423.	65158.	76550.	89910.
	Z	2.4853	2.7200	2.9956	3.2980	3.6382	4.0217	4.4554	4.9470	5.5060	6.1436
	CV/R	3.3694	3.4051	3.4444	3.4861	3.5319	3.5815	3.6353	3.6935	3.7564	3.8242
	CP/R	4.2003	4.2257	4.2534	4.2842	4.3173	4.3528	4.3906	4.4306	4.4724	4.5158
	CP/CV	1.2466	1.2410	1.2351	1.2298	1.2224	1.2154	1.2078	1.1995	1.1906	1.1808
	A(KPS)	7.1018	7.6917	8.2640	8.8828	9.5529	10.279	11.068	11.925	12.858	13.876
2500.	P(ATM)	24017.	28608.	33897.	39944.	47032.	55164.	64575.	75482.	88146.	102879.
	Z	2.3570	2.6064	2.8507	3.1233	3.4280	3.7694	4.1529	4.5847	5.0721	5.6238
	CV/R	3.5327	3.5648	3.5993	3.6365	3.6766	3.7197	3.7660	3.8157	3.8688	3.9255
	CP/R	4.3512	4.3712	4.3934	4.4175	4.4436	4.4713	4.5007	4.5314	4.5631	4.5956
	CP/CV	1.2317	1.2262	1.2206	1.2148	1.2086	1.2021	1.1951	1.1876	1.1795	1.1707
	A(KPS)	7.7048	8.2492	8.8350	9.4661	10.147	10.881	11.676	12.535	13.467	14.479
3000.	P(ATM)	27890.	33102.	39074.	45923.	53784.	62818.	73212.	85187.	99005.	114977.
	Z	2.3100	2.5132	2.7384	2.9885	3.2668	3.5770	3.9237	4.3118	4.7474	5.2376
	CV/R	3.6578	3.6872	3.7187	3.7525	3.7887	3.8273	3.8686	3.9126	3.9594	4.0089
	CP/R	4.4694	4.4838	4.5041	4.5241	4.5455	4.5683	4.5924	4.6173	4.6429	4.6688
	CP/CV	1.2219	1.2166	1.2112	1.2056	1.1998	1.1936	1.1871	1.1801	1.1726	1.1646
	A(KPS)	8.1864	8.7429	9.3400	9.9813	10.671	11.413	12.212	13.074	14.005	15.012

Table 3
Relative Internal Energy and Enthalpy (calories/gm-mole)
and Relative Entropy

TEMPERATURE (DEGREES K.)	DENSITY (AMAGAT)										
	1.	10.	50.	100.	150.	200.	250.	300.	350.	400.	450.
500. U-U0 1126.2 1126.8 1129.5 1134.1 1136.9 1140.9 1142.1 1149.6 1154.4 1159.4 1164.8 H-H0 1577.4 1586.1 1625.9 1678.2 1733.6 1792.3 1854.5 1920.4 1990.4 2064.7 2143.7 (S-S0)/R 1.5089 -0.8012 -2.4446 -3.1812 -3.6513 -3.9648 -4.2451 -4.4659 -4.6699 -4.8547 -5.0253											
520. U-U0 1226.4 1227.0 1230.0 1234.0 1238.2 1242.6 1247.3 1252.2 1257.5 1261.1 1269.1 H-H0 1717.3 1726.4 1767.8 1822.3 1880.0 1941.1 2005.8 2074.5 2147.3 2224.6 2306.7 (S-S0)/R 1.6078 -0.7023 -2.3454 -3.0816 -3.5513 -3.8644 -4.1048 -4.3646 -4.5680 -4.7523 -4.9223											
540. U-U0 1326.6 1327.3 1330.6 1334.9 1339.5 1344.3 1349.5 1354.9 1360.7 1366.9 1373.4 H-H0 1857.2 1866.7 1909.7 1966.4 2026.3 2089.8 2157.1 2228.4 2304.1 2384.4 2469.6 (S-S0)/R 1.7029 -0.6071 -2.2499 -2.9857 -3.4551 -3.7678 -4.0372 -4.2670 -4.4700 -4.6538 -4.8322											
560. U-U0 1426.8 1427.6 1431.2 1435.9 1440.9 1446.1 1451.7 1457.7 1464.0 1471.6 1477.7 H-H0 1997.2 2007.0 2051.7 2110.5 2172.7 2238.6 2305.4 2382.3 2460.7 2544.0 2624.3 (S-S0)/R 1.7947 -0.5152 -2.1578 -2.8933 -3.3423 -3.6746 -3.9436 -4.1730 -4.3755 -4.5588 -4.7277											
580. U-U0 1527.1 1528.0 1531.8 1536.9 1542.3 1548.0 1554.0 1560.5 1567.2 1574.4 1582.1 H-H0 2137.3 2147.5 2193.8 2254.7 2319.1 2387.3 2459.6 2536.2 2617.3 2703.5 2794.9 (S-S0)/R 1.8833 -0.4266 -2.0689 -2.8041 -3.2527 -3.5846 -3.8323 -4.0822 -4.2843 -4.4671 -4.6355											
600. U-U0 1627.5 1628.4 1632.6 1638.0 1643.8 1649.9 1659.4 1663.3 1670.6 1678.3 1686.5 H-H0 2277.5 2287.9 2335.9 2398.9 2465.5 2536.1 2610.6 2690.0 2773.9 2862.9 2957.3 (S-S0)/R 1.9690 -0.3409 -1.9829 -2.7178 -3.1660 -3.4976 -3.7658 -3.9944 -4.1961 -4.3785 -4.5464											
620. U-U0 1727.9 1728.9 1733.4 1739.2 1745.4 1751.9 1758.9 1766.2 1774.0 1782.2 1791.0 H-H0 2417.7 2428.5 2478.0 2543.1 2612.0 2684.8 2762.0 2843.7 2930.3 3022.2 3119.6 (S-S0)/R 2.0519 -0.2579 -1.8997 -2.6343 -3.0822 -3.4134 -3.6813 -3.9095 -4.1107 -4.2927 -4.4602											
640. U-U0 1828.5 1829.5 1834.3 1840.5 1847.1 1854.0 1861.4 1869.2 1877.5 1886.2 1895.5 H-H0 2558.0 2569.2 2620.3 2687.5 2758.5 2833.6 2913.2 2997.5 3086.8 3181.4 3281.8 (S-S0)/R 2.1322 -0.1775 -1.8191 -2.5533 -3.0009 -3.3318 -3.5993 -3.8272 -4.0281 -4.2767 -4.5767											
660. U-U0 1929.2 1930.5 1935.3 1941.9 1948.8 1956.2 1964.0 1972.3 1981.0 1990.3 2000.1 H-H0 2698.4 2709.9 2762.6 2831.8 2905.0 2982.5 3064.4 3151.2 3243.2 3341.6 3444.0 (S-S0)/R 2.2102 -0.0995 -1.7409 -2.4748 -2.9221 -3.2527 -3.5199 -3.7473 -3.9478 -4.1290 -4.2956											
680. U-U0 2029.9 2031.1 2036.4 2043.3 2050.7 2058.5 2065.0 2075.4 2084.7 2094.4 2104.8 H-H0 2838.9 2850.8 2905.1 2976.3 3021.7 3131.4 3219.7 3305.0 3399.5 3499.8 3606.0 (S-S0)/R 2.2859 -0.0237 -1.6649 -2.3986 -2.8456 -3.1758 -3.4427 -3.6698 -3.8700 -4.0507 -4.2170											
700. U-U0 2130.8 2132.0 2137.6 2144.9 2152.7 2160.9 2169.7 2178.7 2188.4 2198.7 2209.6 H-H0 2979.6 2991.8 3047.6 3120.9 3198.4 3280.3 3367.0 3458.8 3555.9 3658.9 3768.0 (S-S0)/R 2.3595 0.0500 -1.5910 -2.3244 -2.7712 -3.1011 -3.3676 -3.5945 -3.7942 -3.9746 -4.1405											
720. U-U0 2231.9 2233.1 2239.0 2246.7 2254.8 2263.4 2272.5 2282.1 2292.3 2303.1 2314.5 H-H0 3120.4 3132.9 3190.3 3265.6 3345.2 3429.4 3518.4 3612.6 3712.4 3818.0 3930.0 (S-S0)/R 2.4312 0.1216 -1.5191 -2.2523 -2.6987 -3.0284 -3.2946 -3.5211 -3.7206 -3.9006 -4.0661											
740. U-U0 2333.0 2334.4 2340.5 2348.6 2357.1 2366.1 2375.6 2385.7 2396.3 2407.6 2419.6 H-H0 3261.3 3274.2 3335.1 3404.0 3492.1 3578.5 3669.9 3766.5 3868.6 3977.2 4092.0 (S-S0)/R 2.5010 0.1915 -1.4491 -2.1820 -2.6282 -2.9576 -3.2323 -3.4497 -3.6488 -3.8285 -3.9936											
760. U-U0 2434.4 2435.8 2442.2 2450.6 2459.5 2468.9 2478.9 2484.9 2500.5 2512.3 2524.8 H-H0 3402.4 3415.7 3476.1 3555.4 3639.2 3727.8 3821.4 3920.5 4025.4 4136.4 4254.0 (S-S0)/R 2.5690 0.2595 -1.3808 -2.1135 -2.5594 -2.8886 -3.1542 -3.3801 -3.5789 -3.7582 -3.9230											
780. U-U0 2535.9 2537.4 2544.1 2552.9 2562.7 2571.9 2582.3 2593.3 2604.9 2617.1 2630.1 H-H0 3545.7 3557.3 3619.2 3700.5 3786.4 3877.2 3973.1 4074.6 4182.0 4295.7 4416.1 (S-S0)/R 2.6354 0.3260 -1.3142 -2.0467 -2.4923 -2.8212 -3.0666 -3.3122 -3.5107 -3.6897 -3.8541											
800. U-U0 2637.7 2639.2 2646.2 2655.3 2664.9 2675.1 2687.9 2697.3 2709.4 2722.1 2735.7 H-H0 3685.2 3699.1 3762.6 3848.5 3933.8 4026.7 4124.9 4228.8 4338.7 4455.0 4578.2 (S-S0)/R 2.7002 0.3908 -1.2492 -1.9814 -2.4268 -2.7555 -3.0206 -3.2459 -3.4441 -3.6228 -3.7869											
820. U-U0 2741.2 2748.4 2757.9 2768.0 2778.6 2789.7 2801.6 2814.1 2827.4 2841.4 2851.4 H-H0 3826.9 3841.2 3906.1 3991.3 4081.4 4176.4 4276.9 4383.1 4495.5 4614.4 4740.3 (S-S0)/R 2.7636 0.4542 -1.1856 -1.9176 -2.3628 -2.6912 -2.9560 -3.1811 -3.3790 -3.5574 -3.7212											
840. U-U0 2841.8 2843.4 2850.9 2860.8 2871.2 2878.1 2882.2 2893.8 2906.1 2919.0 2932.8 2947.3 H-H0 3968.9 3985.4 4049.9 4137.0 4229.1 4326.3 4429.3 4537.6 4652.4 4773.9 4902.6 (S-S0)/R 2.8256 0.5163 -1.2334 -1.8552 -2.3002 -2.6283 -2.8929 -3.1177 -3.3153 -3.4935 -3.6569											
860. U-U0 2944.2 2945.9 2953.7 2963.9 2974.7 2986.0 2998.1 3010.8 3024.2 3038.4 3053.4 H-H0 4111.0 4129.5 4193.8 4282.9 4377.0 4476.3 4581.3 4692.2 4809.5 4933.6 5065.0 (S-S0)/R 2.8662 0.5769 -1.0626 -1.7941 -2.2389 -2.5668 -2.8512 -3.0557 -3.2531 -3.4309 -3.5941											
880. U-U0 3048.6 3056.7 3067.2 3078.4 3090.1 3102.6 3115.7 3129.6 3144.3 3159.8 3175.7 H-H0 4253.4 4268.7 4338.1 4429.1 4525.2 4626.6 4733.6 4847.0 4956.8 5093.4 5227.4 (S-S0)/R 2.9456 0.6364 -1.0030 -1.7343 -2.1789 -2.5066 -2.7707 -2.9950 -3.1921 -3.3696 -3.5325											
900. U-U0 3149.8 3151.6 3159.9 3170.8 3182.3 3194.5 3207.3 3220.9 3235.2 3250.4 3266.4 H-H0 4396.1 4411.7 4482.5 4575.5 4673.6 4771.2 4879.4 5002.1 5124.2 5253.4 5390.1 (S-S0)/R 3.0039 0.6946 -0.9446 -1.6757 -2.1201 -2.4475 -2.7114 -2.9354 -3.1323 -3.3096 -3.4722											
920. U-U0 3253.0 3254.9 3263.5 3274.7 3286.6 3299.1 3312.4 3326.4 3341.1 3356.8 3373.3 H-H0 4539.1 4559.0 4627.3 4722.2 4822.2 4927.2 5028.9 5192.6 5312.7 5513.5 5522.9 (S-S0)/R 3.0609 0.7518 -0.8873 -1.6183 -2.0624 -2.3897 -2.6533 -2.8771 -3.0737 -3.2507 -3.4131											
940. U-U0 3356.5 3358.4 3367.3 3378.9 3391.1 3404.1 3417.7 3432.1 3447.3 3463.4 3480.5 H-H0 4682.4 4698.5 4727.3 4869.1 4971.2 5078.9 5192.6 5312.7 5513.5 5522.9 5522.9 (S-S0)/R 3.1170 0.8078 -0.8711 -1.5619 -2.0058 -2.3329 -2.5563 -2.8199 -3.0162 -3.1930 -3.3551											
960. U-U0 3460.3 3462.3 3471.4 3483.4 3496.0 3509.3 3523.3 3538.2 3553.8 3570.4 3587.9 H-H0 4825.9 4842.4 4917.7 5016.3 5120.4 5230.1 5346.0 5468.4 5597.7 5734.4 5879.0 (S-S0)/R 3.1720 0.8629 -0.7759 -1.5065 -1.9503 -2.2771 -2.5403 -2.7637 -2.9598 -3.1163 -3.2981											
980. U-U0 3564.4 3566.5 3575.9 3588.2 3601.1 3614.8 3629.3 3644.5 3660.6 3677.6 3695.6 H-H0 4969.8 4986.6 5063.5 5163.8 5269.8 5381.7 5499.5 5624.4 5756.0 5895.2 6042.3 (S-S0)/R 3.2260 0.9169 -0.2171 -1.4521 -1.8957 -2.2223 -2.4853 -2.7085 -2.9044 -3.0807 -3.2422											
1000. U-U0 3668.9 3671.0 3680.6 3693.3 3706.6 3720.7 3735.5 3751.2 3767.7 3785.2 3803.7 H-H0 5114.0 5131.1 5219.2 5311.6 5419.6 5533.5 5653.7 5780.6 5914.6 6056.2 6205.9 (S-S0)/R 3.2791 0.9701 -0.6684 -1.3987 -1.8420 -2.1685 -2.4513 -2.6542 -2.8499 -3.0260 -3.1873											

(Table continues)

Table 3 (Continued)

RELATIVE INTERNAL ENERGY AND ENTHALPY (CALORIES/GM-MOLE) AND RELATIVE ENTROPY

TEMPERATURE (DEGREE K)	DENSITY (AMAGAT)									
	500.	550.	600.	650.	700.	750.	800.	850.	900.	950.
500. U-U0 1170.5 1176.6 1183.0 1189.9 1197.2 1205.0 1215.4 1222.2 1231.8 1241.9 1252.8										
H-H0 2227.5 2316.7 2411.6 2512.7 2620.4 2735.1 2857.6 2988.2 3127.9 3277.1 3436.8										
(S-S0)/R -5.1850 -5.3363 -5.4810 -5.6206 -5.7561 -5.8884 -6.0184 -6.1466 -6.2735 -6.3998 -6.5258										
520. U-U0 1275.4 1282.1 1289.2 1296.8 1304.9 1313.6 1322.8 1332.6 1343.1 1354.3 1366.3										
H-H0 2393.9 2486.7 2585.4 2690.4 2802.3 2921.5 3048.7 3184.4 3329.4 3484.3 3650.0										
(S-S0)/R -5.0814 -5.2321 -5.3762 -5.5150 -5.6497 -5.7813 -5.9103 -6.0376 -6.1636 -6.2888 -6.4136										
540. U-U0 1380.3 1387.6 1395.5 1403.8 1412.7 1422.1 1432.2 1443.0 1454.4 1466.7 1479.8										
H-H0 2560.1 2656.4 2758.8 2867.7 2983.8 3107.4 3239.2 3379.9 3530.1 3690.6 3862.2										
(S-S0)/R -4.9818 -5.1318 -5.2752 -5.4134 -5.5474 -5.6781 -5.8064 -5.9328 -6.0578 -6.1821 -6.3058										
560. U-U0 1485.2 1493.2 1501.7 1510.8 1520.4 1530.7 1541.6 1553.3 1565.7 1579.0 1593.2										
H-H0 2726.1 2825.8 2931.9 3044.7 3164.8 3292.8 3429.2 3574.8 3730.1 3896.1 4073.5										
(S-S0)/R -4.8857 -5.0352 -5.1780 -5.3155 -5.4488 -5.5788 -5.7163 -5.8318 -5.9560 -6.0792 -6.2020										
580. U-U0 1590.2 1598.8 1608.0 1617.7 1628.1 1639.2 1651.0 1663.5 1676.9 1691.3 1706.6										
H-H0 2891.9 2991.1 3104.7 3221.3 3345.5 3477.7 3618.7 3769.0 3929.4 4100.8 4283.9										
(S-S0)/R -4.7930 -4.9419 -5.0841 -5.2210 -5.3536 -5.4829 -5.6197 -5.7344 -5.8577 -5.9801 -6.1019										
600. U-U0 1695.2 1704.4 1714.3 1724.7 1735.8 1747.7 1760.3 1773.8 1788.1 1803.5 1819.8										
H-H0 3057.6 3164.1 3277.3 3397.7 3525.8 3662.3 3807.7 3962.7 4128.1 4304.8 4493.5										
(S-S0)/R -4.7034 -4.8518 -4.9934 -5.1297 -5.2617 -5.3903 -5.5163 -5.6403 -5.7628 -5.8844 -6.0053										
620. U-U0 1800.3 1810.1 1820.6 1831.7 1843.6 1856.2 1869.7 1884.0 1899.3 1915.6 1933.1										
H-H0 3223.0 3332.9 3449.6 3575.7 3705.8 3846.4 3996.2 4155.9 4326.2 4508.1 4702.3										
(S-S0)/R -4.6167 -4.7646 -4.9057 -5.0414 -5.1728 -5.3008 -5.4261 -5.5493 -5.6711 -5.7918 -5.9118										
640. U-U0 1905.4 1915.8 1927.0 1938.8 1951.4 1964.8 1979.1 1994.3 2010.5 2027.8 2046.3										
H-H0 3388.4 3501.5 3621.7 3749.6 3885.5 4030.2 4184.5 4348.6 4523.7 4710.7 4910.4										
(S-S0)/R -4.5327 -4.6801 -4.8207 -4.9558 -5.0866 -5.2140 -5.3387 -5.4612 -5.5822 -5.7021 -5.8213										
660. U-U0 2010.6 2021.6 2033.4 2045.9 2059.2 2073.4 2088.5 2104.5 2121.7 2139.9 2159.4										
H-H0 3553.6 3670.0 3793.7 3925.1 4064.9 4213.6 4372.0 4540.8 4720.7 4912.7 5117.7										
(S-S0)/R -4.4512 -4.5981 -4.7382 -4.8728 -5.0031 -5.1299 -5.2539 -5.3758 -5.4961 -5.6153 -5.7337										
680. U-U0 2115.8 2127.5 2139.9 2153.1 2167.1 2182.0 2197.9 2214.8 2232.8 2252.1 2272.6										
H-H0 3718.7 3838.4 3965.5 4100.5 4244.0 4396.8 4559.4 4732.6 4917.3 5114.2 5324.5										
(S-S0)/R -4.3721 -4.5186 -4.6582 -4.7923 -4.9220 -5.0482 -5.1717 -5.2930 -5.4126 -5.5310 -5.6486										
700. U-U0 2221.2 2233.5 2246.5 2260.4 2275.1 2290.7 2307.4 2325.2 2344.1 2364.3 2385.8										
H-H0 3883.8 4006.6 4137.1 4275.7 4423.0 4579.7 4746.4 4924.0 5113.3 5315.2 5530.6										
(S-S0)/R -4.2952 -4.4413 -4.5804 -4.7140 -4.8433 -4.9689 -5.0918 -5.2124 -5.3314 -5.4492 -5.5661										
720. U-U0 2326.7 2339.5 2353.2 2367.7 2383.1 2399.5 2417.0 2435.6 2455.4 2476.5 2499.0										
H-H0 4048.8 4174.8 4308.6 4450.7 4601.7 4762.3 4933.2 5115.1 5309.0 5515.6 5736.2										
(S-S0)/R -4.2204 -4.3661 -4.5048 -4.6379 -4.7666 -4.8918 -5.0141 -5.1342 -5.2525 -5.3696 -5.4858										
740. U-U0 2432.3 2445.7 2460.0 2475.2 2493.1 2508.4 2526.7 2546.1 2566.7 2588.8 2612.3										
H-H0 4213.8 4342.9 4480.0 4625.6 4780.2 4944.7 5119.6 5305.8 5504.2 5715.7 5941.2										
(S-S0)/R -4.1476 -4.2928 -4.4311 -4.5638 -4.6920 -4.8167 -4.9585 -5.0580 -5.1757 -5.2922 -5.4077										
760. U-U0 2538.0 2552.1 2567.0 2582.8 2599.6 2617.4 2636.4 2656.6 2678.2 2701.1 2725.6										
H-H0 4378.7 4511.0 4651.3 4800.3 4958.6 5126.9 5308.0 5496.3 5699.1 5915.3 6145.8										
(S-S0)/R -4.0766 -4.2214 -4.3593 -4.4916 -4.6194 -4.7435 -4.8648 -4.9837 -5.1009 -5.2167 -5.3316										
780. U-U0 2643.9 2658.5 2674.0 2690.5 2708.0 2726.6 2746.3 2767.3 2789.7 2813.5 2839.0										
H-H0 4493.7 4679.0 4822.6 4975.0 5136.9 5308.9 5491.8 5686.5 5893.7 6114.5 6349.9										
(S-S0)/R -4.0074 -4.1518 -4.2893 -4.4211 -4.5485 -4.6722 -4.7929 -4.9114 -5.0280 -5.1432 -5.2575										
800. U-U0 2750.0 2765.2 2781.3 2798.4 2816.5 2835.8 2856.3 2878.1 2901.4 2926.1 2952.5										
H-H0 4708.7 4847.1 4993.9 5149.6 5315.1 5490.8 5677.7 5876.4 6088.0 6313.4 6553.7										
(S-S0)/R -3.9398 -4.0839 -4.2209 -4.3524 -4.4793 -4.6025 -4.7228 -4.8407 -4.9568 -5.0715 -5.1851										
820. U-U0 2856.2 2872.0 2888.7 2906.4 2925.3 2945.2 2966.5 2989.1 3113.2 3038.8 3066.1										
H-H0 4873.7 5015.2 5165.1 5324.2 5493.2 5672.6 5863.3 6066.2 6282.1 6512.0 6757.0										
(S-S0)/R -3.8737 -4.0175 -4.1542 -4.2852 -4.4117 -4.5345 -4.6543 -4.7718 -4.8873 -5.0015 -5.1145										
840. U-U0 2962.7 2979.0 2996.3 3014.7 3034.2 3054.8 3076.8 3100.2 3125.1 3151.6 3179.8										
H-H0 5038.9 5183.3 5336.4 5498.8 5671.2 5854.3 6048.9 6255.8 6475.9 6710.3 6960.1										
(S-S0)/R -3.8092 -3.9526 -4.0898 -4.2196 -4.3457 -4.4680 -4.5874 -4.7044 -4.8194 -4.9330 -5.0455										
860. U-U0 3069.4 3086.2 3104.1 3123.1 3143.3 3164.6 3187.4 3211.5 3237.2 3264.6 3293.7										
H-H0 5204.0 5351.4 5507.6 5673.4 5849.2 6035.9 6234.3 6445.2 6669.6 6908.4 7162.8										
(S-S0)/R -3.7460 -3.8891 -4.0250 -4.1553 -4.2810 -4.4030 -4.5219 -4.6384 -4.7530 -4.8661 -4.9781										
880. U-U0 3176.3 3193.7 3212.2 3231.8 3252.6 3274.6 3298.1 3323.0 3349.5 3377.7 3407.7										
H-H0 5369.3 5519.7 5679.0 5847.9 6027.2 6217.5 6419.7 6634.5 6863.1 7106.3 7365.2										
(S-S0)/R -3.6841 -3.8269 -3.9625 -4.0925 -4.2178 -4.3499 -4.4579 -4.5739 -4.6880 -4.8006 -4.9121										
900. U-U0 3283.4 3301.4 3320.5 3340.7 3362.1 3384.9 3409.0 3434.7 3462.0 3491.0 3522.0										
H-H0 5534.8 5688.0 5850.4 6022.6 6205.2 6399.1 6605.9 6823.8 7056.4 7303.9 7567.5										
(S-S0)/R -3.6235 -3.7660 -3.9013 -4.0309 -4.1558 -4.2770 -4.4391 -4.5108 -4.6244 -4.7365 -4.8475										
920. U-U0 3390.8 3409.3 3429.0 3449.8 3471.9 3495.3 3520.2 3546.6 3574.7 3604.6 3636.4										
H-H0 5700.3 5856.5 6021.9 6197.3 6383.3 6580.6 6790.2 7012.9 7249.6 7501.4 7769.5										
(S-S0)/R -3.5641 -3.7062 -3.8412 -3.9705 -4.0951 -4.2159 -4.3336 -4.4488 -4.5621 -4.6737 -4.7842										
940. U-U0 3498.5 3517.6 3537.8 3559.2 3581.9 3606.0 3631.6 3658.8 3687.6 3718.3 3751.0										
H-H0 5866.0 6025.1 6193.5 6372.0 6561.4 6762.2 6975.5 7202.0 7442.8 7698.8 7971.3										
(S-S0)/R -3.5058 -3.6476 -3.7823 -3.9113 -4.0355 -4.1560 -4.2733 -4.3881 -4.5009 -4.6121 -4.7221										
960. U-U0 3606.4 3626.1 3646.8 3668.9 3692.2 3717.0 3743.2 3771.1 3800.8 3832.3 3865.9										
H-H0 6011.9 6193.8 6365.2 6546.9 6739.5 6943.9 7160.7 7391.1 7635.8 7896.1 8173.0										
(S-S0)/R -3.4486 -3.5902 -3.7245 -3.8532 -3.9771 -4.0972 -4.2141 -4.3286 -4.4410 -4.5517 -4.6612										
980. U-U0 3714.7 3734.8 3756.2 3778.8 3802.8 3828.2 3855.2 3883.8 3914.2 3946.6 3981.0										
H-H0 6198.0 6362.7 6537.1 6721.9 6917.8 7125.6 7346.0 7580.1 7828.8 8093.2 8374.5										
(S-S0)/R -3.3924 -3.5337 -3.6678 -3.7961 -3.9197 -4.0395 -4.1561 -4.2701 -4.3821 -4.4924 -4.6015										
1000. U-U0 3823.2 3843.9 3865.8 3889.0 3913.6 3939.7 3967.4 3996.7 4027.9 4061.1 4096.3										
H-H0 6364.2 6531.8 6709.2 6897.0 7096.2 7307.3 7531.4 7769.2 8021.8 8290.3 8575.9										
(S-S0)/R -3.3372 -3.4782 -3.6120 -3.7400 -3.8633 -3.9827 -4.0990 -4.2127 -4.3243 -4.4342 -4.5429										

(Table continues)

Table 3 (Continued)

RELATIVE INTERNAL ENERGY AND ENTHALPY (CALORIES/GM-MOLE) AND RELATIVE ENTROPY

TEMPERATURE (DEGREE K)	DENSITY (AMAGAT)										
	1050.	1100.	1150.	1200.	1250.	1300.	1350.	1400.	1450.	1500.	1550.
500. U-UO	1264.4	1276.9	1290.2	1304.6	1320.0	1336.6	1354.5	1373.7	1394.4	1416.8	1441.0
H-HO	3607.8	3791.0	3987.6	4198.5	4425.1	4668.8	4931.1	5213.7	5518.5	5847.6	6203.3
(S-S0)/R	-6.6519	-6.7784	-6.9058	-7.0343	-7.1643	-7.2961	-7.4299	-7.5661	-7.7050	-7.8469	-7.9921
520. U-UO	1379.2	1393.0	1407.7	1423.5	1440.6	1458.8	1478.5	1499.7	1522.6	1547.2	1573.9
H-HO	3827.4	4017.5	4221.2	4439.9	4674.7	4927.2	5198.9	5491.5	5807.1	6147.6	6515.6
(S-S0)/R	-6.5385	-6.6638	-6.7898	-6.9169	-7.0493	-7.1754	-7.3074	-7.4417	-7.5785	-7.7182	-7.8610
540. U-UO	1493.9	1508.9	1525.0	1542.3	1560.9	1580.8	1602.5	1625.4	1650.4	1677.2	1706.3
H-HO	4045.9	4242.6	4423.5	4679.7	4922.6	5183.7	5464.5	5766.9	6092.9	6444.5	6824.4
(S-S0)/R	-6.4296	-6.5537	-6.6784	-6.8041	-6.9310	-7.0595	-7.1986	-7.3223	-7.4571	-7.5944	-7.7352
560. U-UO	1608.5	1624.7	1642.2	1660.9	1681.0	1702.6	1725.9	1750.9	1777.8	1806.9	1838.2
H-HO	4263.4	4466.6	4684.5	4918.1	5168.9	5438.3	5728.1	6040.0	6376.1	6738.6	7130.0
(S-S0)/R	-6.3247	-6.4476	-6.5711	-6.6955	-6.8210	-6.9480	-7.0767	-7.2074	-7.3404	-7.4760	-7.6144
580. U-UO	1722.9	1740.5	1759.3	1779.4	1801.0	1824.2	1849.2	1876.0	1904.9	1936.1	1969.8
H-HO	4479.8	4689.5	4914.1	5155.0	5413.5	5691.1	5986.9	6310.8	6656.8	7029.9	7432.5
(S-S0)/R	-6.2236	-6.3454	-6.4677	-6.5908	-6.7151	-6.8406	-6.9678	-7.0969	-7.2281	-7.3618	-7.4982
600. U-UO	1837.4	1856.1	1876.2	1897.7	1920.8	1945.6	1972.3	2000.9	2031.8	2065.1	2101.0
H-HO	4695.3	4911.3	5142.6	5309.6	5656.6	5942.3	6249.3	6579.6	6935.2	7318.5	7732.2
(S-S0)/R	-6.1259	-6.2467	-6.3679	-6.4899	-6.6128	-6.7370	-6.8628	-6.9903	-7.1199	-7.2918	-7.3862
620. U-UO	1951.7	1971.7	1993.0	2015.9	2040.5	2066.8	2095.1	2125.6	2158.4	2193.7	2231.8
H-HO	4910.0	5132.1	5307.0	5624.9	5898.4	6191.8	6507.2	6846.3	7211.4	7604.8	8029.1
(S-S0)/R	-6.0316	-6.1514	-6.2715	-6.3923	-6.5141	-6.6370	-6.7614	-6.8874	-7.0154	-7.1456	-7.2783
640. U-UO	2066.0	2087.2	2109.8	2134.0	2160.0	2187.9	2217.8	2250.0	2284.7	2322.0	2362.2
H-HO	5123.8	5352.0	5596.3	5858.1	6138.7	6439.9	6764.5	7111.2	7485.5	7888.6	8323.4
(S-S0)/R	-5.9402	-6.0591	-6.1782	-6.2980	-6.4185	-6.5403	-6.6633	-6.7880	-6.9145	-7.0431	-7.1740
660. U-UO	2180.3	2202.6	2224.6	2252.0	2279.4	2308.8	2340.3	2374.2	2410.7	2450.0	2492.3
H-HO	5336.8	5571.0	5821.6	6090.1	6377.9	6686.6	7018.1	7374.3	7757.6	8170.3	8615.2
(S-S0)/R	-5.8517	-5.9697	-6.0878	-6.2066	-6.3261	-6.4466	-6.5684	-6.6918	-6.8169	-6.9439	-7.0732
680. U-UO	2294.5	2318.0	2343.1	2369.9	2398.7	2429.6	2462.7	2498.3	2536.6	2577.8	2622.2
H-HO	5549.1	5789.2	6046.0	6321.1	6615.8	6931.9	7271.2	7635.8	8027.9	8449.9	8904.8
(S-S0)/R	-5.7658	-5.8829	-6.0002	-6.1179	-6.2364	-6.3558	-6.4765	-6.5986	-6.7223	-6.8479	-6.9757
700. U-UO	2408.8	2433.4	2459.6	2487.8	2517.9	2550.2	2584.9	2622.2	2662.2	2704.3	2751.7
H-HO	5760.7	6006.5	6269.5	6551.0	6826.2	7176.0	7523.0	7895.7	8296.4	8727.6	9192.1
(S-S0)/R	-5.6825	-5.7988	-5.9151	-6.0319	-6.1494	-6.2678	-6.3873	-6.5082	-6.6306	-6.7549	-6.8811
720. U-UO	2523.0	2548.7	2576.2	2605.6	2637.1	2670.8	2707.1	2745.9	2787.7	2832.7	2881.1
H-HO	5971.6	6223.2	6492.2	6780.1	7088.4	7418.6	7773.4	8154.1	8563.2	9003.4	9477.4
(S-S0)/R	-5.6015	-5.7169	-5.8325	-5.9484	-6.0649	-6.1823	-6.3007	-6.4204	-6.5416	-6.6646	-6.7894
740. U-UO	2637.3	2664.1	2692.8	2723.4	2756.2	2791.4	2829.1	2869.6	2913.1	2959.8	3010.2
H-HO	6182.0	6439.2	6714.1	7008.2	7323.1	7660.6	8022.5	8411.0	8828.5	9277.4	9760.7
(S-S0)/R	-5.5226	-5.6374	-5.7521	-5.8671	-5.9827	-6.0991	-6.2165	-6.3351	-6.4552	-6.5769	-6.7004
760. U-UO	2751.7	2779.6	2809.4	2841.2	2875.3	2911.9	2951.1	2993.1	3038.3	3086.9	3139.1
H-HO	6391.8	6654.5	6935.2	7235.9	7556.9	7901.3	8270.5	8666.7	9092.2	9549.7	10042.
(S-S0)/R	-5.4459	-5.5599	-5.6738	-5.7881	-5.9028	-6.0182	-6.1346	-6.2522	-6.3711	-6.4916	-6.6138
780. U-UO	2866.1	2895.0	2926.0	2959.1	2994.5	3032.4	3075.0	3116.6	3163.4	3213.7	3267.9
H-HO	6601.1	6869.2	7155.7	7462.1	7789.9	8140.1	8517.3	8921.1	9354.6	9820.5	10322.
(S-S0)/R	-5.3711	-5.4844	-5.5976	-5.7110	-5.8249	-5.9395	-6.0549	-6.1715	-6.2893	-6.4086	-6.5297
800. U-UO	2980.6	3010.6	3042.7	3076.9	3113.6	3152.9	3194.9	3240.0	3288.5	3340.5	3396.5
H-HO	6809.9	7083.4	7375.6	7687.9	8022.0	8379.8	8763.1	9174.3	9615.6	10090.	10600.
(S-S0)/R	-5.2981	-5.4107	-5.5232	-5.6359	-5.7490	-5.8627	-5.9772	-6.0928	-6.2096	-6.3278	-6.4477
820. U-UO	3095.2	3126.2	3159.4	3194.9	3232.8	3273.4	3316.8	3363.5	3413.5	3467.2	3525.0
H-HO	7018.3	7297.1	7594.8	7913.0	8253.4	8617.7	9009.7	9426.4	9875.4	10358.	10876.
(S-S0)/R	-5.2269	-5.3439	-5.4507	-5.5626	-5.6749	-5.7878	-5.9014	-6.0161	-6.1319	-6.2491	-6.3678
840. U-UO	3209.9	3242.0	3276.3	3312.9	3352.0	3393.9	3438.8	3486.9	3538.5	3593.9	3653.4
H-HO	7226.3	7510.3	7813.6	8137.6	8484.0	8854.8	9251.8	9677.4	10134.	10624.	11151.
(S-S0)/R	-5.1573	-5.2686	-5.3798	-5.4910	-5.6026	-5.7147	-5.8275	-5.9412	-6.0561	-6.1723	-6.2899
860. U-UO	3324.7	3357.9	3393.2	3431.0	3471.3	3514.5	3560.8	3610.3	3663.5	3720.5	3781.8
H-HO	7433.9	7723.1	8031.8	8361.5	8714.0	9091.1	9494.8	9927.5	10391.	10890.	11425.
(S-S0)/R	-5.0893	-5.2000	-5.3105	-5.4211	-5.5319	-5.6432	-5.7552	-5.8681	-5.9821	-6.0973	-6.2139
880. U-UO	3439.7	3473.9	3510.3	3549.2	3590.8	3635.2	3682.8	3733.8	3788.4	3847.1	3910.1
H-HO	7641.2	7935.5	8249.5	8584.9	8943.3	9326.7	9730.1	10177.	10648.	11154.	11697.
(S-S0)/R	-5.0227	-5.1329	-5.2428	-5.3527	-5.4628	-5.5734	-5.6846	-5.7967	-5.9097	-6.0240	-6.1396
900. U-UO	3554.9	3590.1	3627.5	3667.5	3710.3	3756.0	3804.9	3857.3	3913.5	3973.7	4038.4
H-HO	7848.2	8147.5	8466.9	8807.8	9172.1	9561.6	9978.4	10425.	10903.	11417.	11968.
(S-S0)/R	-4.9576	-5.0672	-5.1765	-5.2857	-5.3952	-5.5051	-5.6155	-5.7268	-5.8390	-5.9524	-6.0670
920. U-UO	3670.3	3704.6	3744.9	3786.0	3830.0	3876.9	3927.1	3980.9	4038.6	4100.4	4166.8
H-HO	8055.0	8359.3	8683.8	9030.3	9400.3	9795.9	10219.	10672.	11158.	11679.	12238.
(S-S0)/R	-4.8938	-5.0028	-5.1115	-5.2202	-5.3290	-5.4382	-5.5479	-5.6584	-5.7698	-5.8823	-5.9961
940. U-UO	3785.8	3822.9	3862.5	3904.7	3949.8	3998.0	4049.5	4104.6	4163.7	4227.1	4295.1
H-HO	8261.5	8570.7	8900.4	9252.3	9628.0	10030.	10459.	10919.	11412.	11940.	12507.
(S-S0)/R	-4.8312	-4.9397	-5.0479	-5.1559	-5.2641	-5.3726	-5.4817	-5.5914	-5.7021	-5.8137	-5.9266
960. U-UO	3901.6	3939.7	3980.3	4023.6	4069.8	4119.2	4172.0	4228.5	4289.0	4353.9	4423.5
H-HO	8467.8	8781.8	9116.7	9473.9	9855.3	10263.	10699.	11165.	11664.	12200.	12774.
(S-S0)/R	-4.7699	-4.8778	-4.9855	-5.0929	-5.2005	-5.3084	-5.4168	-5.5258	-5.6357	-5.7465	-5.8585
980. U-UO	4017.6	4056.6	4098.2	4142.6	4189.9	4240.5	4294.6	4352.4	4414.4	4480.8	4552.0
H-HO	8673.9	8992.7	9322.6	9695.2	10082.	10496.	10937.	11410.	11916.	12459.	13041.
(S-S0)/R	-4.7096	-4.8171	-4.9242	-5.0312	-5.1382	-5.2454	-5.3531	-5.4615	-5.5706	-5.6807	-5.7919
1000. U-UO	4133.9	4173.8	4216.4	4261.8	4310.3	4362.1	4417.4	4476.5	4539.9	4607.7	4680.5
H-HO	8879.8	9203.5	9548.3	9916.1	10309.	10728.	11176.	11655.	12168.	12717.	13307.
(S-S0)/R	-4.6505	-4.7575	-4.8641	-4.9705	-5.0770	-5.1836	-5.2907	-5.3984	-5.5068	-5.6161	-5.7265

(Table continues)

Table 3 (Continued)

RELATIVE INTERNAL ENERGY AND ENTHALPY (CALORIES/GM-MOLE) AND RELATIVE ENTRPY

TEMPERATURE (DEGREE K)	DENSITY (AMAGAT)								
	1600.	1650.	1700.	1750.	1800.	1850.	1900.	1950.	2000.
500. U-U0 1467.2 1495.6 1526.4 1559.8 1590.1 1635.7 1678.9 1726.0 1777.6									
H-H0 6588.1 7005.1 7457.4 7948.6 8482.7 9064.4 9698.7 10391. 11149.	-8.1410	-8.2938	-8.4509	-8.6128	-8.7797	-8.9522	-9.1305	-9.3153	-9.5069
520. U-U0 1602.7 1633.9 1667.8 1704.5 1744.5 1787.9 1835.3 1887.1 1943.7									
H-H0 6913.6 7344.6 7812.0 8319.4 8871.0 9471.4 10126. 10840. 11621.	-8.0072	-8.1572	-8.3113	-8.4699	-8.6333	-8.8019	-8.9761	-9.1563	-9.3430
540. U-U0 1737.7 1771.7 1808.5 1848.5 1892.0 1939.2 1990.7 2047.0 2108.4									
H-H0 7235.2 7679.8 8161.8 8684.9 9253.3 9871.7 10546. 11281. 12084.	-7.8790	-8.0264	-8.1776	-8.3331	-8.4932	-8.6582	-8.8284	-9.0044	-9.1865
560. U-U0 1872.2 1908.9 1948.6 1991.8 2038.6 2089.6 2145.1 2205.7 2271.8									
H-H0 7553.1 8011.0 8507.2 9045.4 9630.0 10266. 10998. 11714. 12539.	-7.7559	-7.9008	-8.0493	-8.2019	-8.3598	-8.5205	-8.6871	-8.8591	-9.0369
580. U-U0 2006.2 2045.5 2088.2 2134.4 2184.6 2239.1 2298.5 2363.3 2434.0									
H-H0 7867.7 8338.4 8848.2 9401.1 10001. 10654. 11364. 12139. 12985.	-7.6375	-7.7800	-7.9261	-8.0760	-8.2300	-8.3884	-8.5516	-8.7199	-8.8936
600. U-U0 2139.8 2181.7 2227.1 2276.3 2329.8 2387.8 2451.0 2519.8 2595.0									
H-H0 8179.0 8662.2 9105.3 9752.4 10368. 11037. 11764. 12550. 13423.	-7.5235	-7.6638	-7.8075	-7.9549	-8.1061	-8.2615	-8.4215	-8.5863	-8.7563
620. U-U0 2272.9 2317.4 2365.5 2417.7 2474.2 2535.7 2602.5 2675.4 2754.8									
H-H0 8487.3 8982.6 9518.6 10099. 10730. 11414. 12159. 12970. 13854.	-7.4136	-7.5519	-7.6933	-7.8382	-7.9868	-8.1395	-8.2964	-8.4579	-8.6243
640. U-U0 2405.7 2452.6 2503.4 2558.4 2618.0 2682.8 2753.3 2829.9 2913.5									
H-H0 8792.6 9299.7 9848.3 10443. 11087. 11787. 12547. 13376. 14279.	-7.3075	-7.4438	-7.5831	-7.7257	-7.8719	-8.0219	-8.1760	-8.3344	-8.4975
660. U-U0 2538.0 2587.4 2640.8 2698.6 2761.2 2829.2 2903.1 2983.6 3071.2									
H-H0 9095.3 9613.9 10175. 10782. 11440. 12155. 12951. 13776. 14697.	-7.2050	-7.3394	-7.4767	-7.6172	-7.7610	-7.9085	-8.0599	-8.2154	-8.3753
680. U-U0 2670.1 2721.8 2777.7 2838.2 2903.8 2975.0 3052.3 3136.4 3228.0									
H-H0 9395.3 9925.1 10498. 11118. 11789. 12518. 13310. 14171. 15109.	-7.1058	-7.2384	-7.3738	-7.5122	-7.6539	-7.7990	-7.9478	-8.1006	-8.2576
700. U-U0 2801.8 2855.9 2914.3 2977.4 3045.9 3120.1 3200.7 3288.3 3383.8									
H-H0 9693.0 10234. 10818. 11450. 12135. 12877. 13684. 14561. 15515.	-7.0096	-7.1406	-7.2742	-7.4106	-7.5502	-7.6931	-7.8395	-7.9897	-8.1439
720. U-U0 2933.3 2989.6 3050.4 3116.2 3187.4 3264.6 3348.4 3439.5 3538.7									
H-H0 9988.3 10540. 11135. 11779. 12477. 13233. 14054. 14946. 15916.	-6.9164	-7.0458	-7.1776	-7.3123	-7.4499	-7.5906	-7.7347	-7.8825	-8.0340
740. U-U0 3064.4 3123.0 3186.2 3254.5 3328.5 3408.6 3495.6 3590.0 3692.8									
H-H0 10281. 10843. 11450. 12106. 12815. 13585. 14419. 15326. 16312.	-6.8260	-6.9538	-7.0840	-7.2169	-7.3526	-7.4913	-7.6333	-7.7787	-7.9277
760. U-U0 3195.4 3256.1 3321.6 3392.4 3469.1 3552.1 3642.1 3739.8 3846.1									
H-H0 10572. 11144. 11762. 12429. 13151. 13933. 14781. 15702. 16704.	-6.7380	-6.8644	-6.9931	-7.1243	-7.2502	-7.3950	-7.5349	-7.6781	-7.8248
780. U-U0 3326.2 3389.0 3456.8 3530.1 3609.3 3695.1 3788.1 3889.0 3988.8									
H-H0 10862. 11443. 12071. 12750. 13483. 14278. 15159. 16074. 17090.	-6.6526	-6.7775	-6.9047	-7.0343	-7.1665	-7.3015	-7.4595	-7.5806	-7.7250
800. U-U0 3456.7 3521.7 3591.7 3667.3 3749.1 3837.6 3933.6 4037.7 4150.7									
H-H0 11149. 11740. 12379. 13068. 13813. 14620. 15494. 16442. 17473.	-6.5693	-6.6929	-6.8187	-6.9468	-7.0774	-7.2106	-7.3468	-7.4859	-7.6282
820. U-U0 3587.2 3654.2 3726.4 3804.4 3888.6 3979.8 4078.6 4185.7 4302.1									
H-H0 11434. 12036. 12684. 13384. 14140. 14959. 15845. 16807. 17851.	-6.4883	-6.6106	-6.7350	-6.8616	-6.9907	-7.1223	-7.2966	-7.3938	-7.5341
840. U-U0 3717.5 3786.5 3860.9 3941.1 4027.8 4121.6 4223.2 4333.3 4452.9									
H-H0 11718. 12329. 12987. 13697. 14465. 15295. 16193. 17168. 18226.	-6.4092	-6.5303	-6.6534	-6.7787	-6.9062	-7.0363	-7.1689	-7.3043	-7.4426
860. U-U0 3847.7 3918.7 3995.2 4077.4 4166.8 4263.1 4367.4 4480.5 4603.1									
H-H0 12000. 12620. 13288. 14009. 14787. 15628. 16539. 17526. 18597.	-6.3321	-6.4520	-6.5739	-6.6978	-6.8239	-6.9524	-7.0835	-7.2171	-7.3536
880. U-U0 3977.9 4050.8 4129.3 4214.0 4305.5 4404.4 4511.3 4627.2 4752.9									
H-H0 12281. 12910. 13587. 14318. 15016. 15959. 16881. 17880. 18964.	-6.2568	-6.3756	-6.4962	-6.6189	-6.7437	-6.8707	-7.0002	-7.1322	-7.2670
900. U-U0 4108.0 4182.8 4263.4 4350.3 4444.0 4545.3 4654.9 4773.6 4902.2									
H-H0 12561. 13198. 13885. 14625. 15424. 16287. 17221. 18232. 19328.	-6.1832	-6.3009	-6.4204	-6.5418	-6.6653	-6.7910	-6.9190	-7.0494	-7.1825
920. U-U0 4238.1 4314.8 4397.3 4486.3 4582.4 4686.1 4798.2 4919.6 5051.2									
H-H0 12839. 13458. 14181. 14931. 15740. 16613. 17558. 18581. 19690.	-6.1112	-6.2279	-6.3463	-6.4666	-6.5888	-6.7131	-6.8397	-6.9687	-7.1001
940. U-U0 4368.2 4446.7 4531.2 4622.3 4720.5 4826.6 4941.2 5065.3 5199.7									
H-H0 13116. 13770. 14475. 15234. 16053. 16937. 17893. 18827. 20048.	-6.0408	-6.1665	-6.2738	-6.3930	-6.5140	-6.6370	-6.7623	-6.8898	-7.0197
960. U-U0 4498.3 4578.6 4665.1 4758.2 4858.6 4967.0 5084.1 5210.8 5348.0									
H-H0 13591. 14054. 14768. 15536. 16365. 17259. 18225. 19271. 20403.	-5.9718	-6.0866	-6.2029	-6.3209	-6.4408	-6.5626	-6.6866	-6.8127	-6.9411
980. U-U0 4628.4 4710.6 4798.9 4894.0 4966.6 5072.2 5226.7 5356.0 5495.9									
H-H0 13666. 14337. 15059. 15837. 16675. 17579. 18596. 19612. 20756.	-5.9043	-6.0181	-6.1334	-6.2504	-6.3692	-6.4899	-6.6125	-6.7373	-6.8643
1000. U-U0 4758.6 4842.5 4932.7 5029.9 5134.5 5247.4 5369.2 5501.0 5643.6									
H-H0 13939. 14619. 15349. 16136. 16983. 17897. 18884. 19951. 21106.	-5.8381	-5.9510	-6.0654	-6.1814	-6.2991	-6.4186	-6.5401	-6.6636	-6.7892
(S-S0)/R									

(Table continues)

Table 3 (Continued)

RELATIVE INTERNAL ENERGY AND ENTHALPY (CALORIES/GM-MOLE) AND RELATIVE ENTROPY

TEMPERATURE (DEGREE K)	DENSITY (AMAGAT)												
	1.	10.	50.	100.	150.	200.	250.	300.	350.	400.	450.		
1020. U-U0 H-H0 (S-S0)/R	3773.6	3775.8	3785.7	3798.7	3812.4	3826.8	3842.1	3858.2	3875.1	3893.1	3912.1		
	5258.5	5276.0	5355.5	5459.8	5569.7	5685.6	5807.9	5937.1	6073.4	6217.4	6369.7		
	3.3314	1.0223	-0.6160	-1.3461	-1.7893	-2.1156	-2.3782	-2.6009	-2.7964	-2.9722	-3.1333		
1040. U-U0 H-H0 (S-S0)/R	3878.8	3881.0	3891.2	3904.5	3918.6	3933.4	3949.7	3965.0	3982.9	4001.3	4020.8		
	5403.4	5421.2	5502.2	5608.3	5720.1	5838.1	5962.5	6093.8	6232.5	6379.0	6533.7		
	3.3827	1.0737	-0.5645	-1.2944	-1.7374	-2.0635	-2.3259	-2.5484	-2.7437	-2.9193	-3.0801		
1060. U-U0 H-H0 (S-S0)/R	3984.3	3986.5	3997.0	4010.6	4025.0	4040.2	4056.3	4073.2	4091.0	4109.9	4129.8		
	5548.7	5566.7	5649.1	5757.1	5870.9	5990.8	6117.4	6250.9	6391.9	6540.7	6698.0		
	3.4333	1.1244	-0.5138	-1.2435	-1.6864	-2.0123	-2.2475	-2.4968	-2.6919	-2.8672	-3.0279		
1080. U-U0 H-H0 (S-S0)/R	4090.4	4092.4	4103.1	4117.1	4131.9	4147.5	4163.9	4181.2	4199.5	4218.8	4239.2		
	5694.3	5712.6	5796.4	5906.2	6021.9	6143.9	6272.5	6408.3	6551.5	6702.8	6862.6		
	3.4831	1.1742	-0.4638	-1.1934	-1.6361	-1.9618	-2.2239	-2.4460	-2.6408	-2.8160	-2.9764		
1100. U-U0 H-H0 (S-S0)/R	4196.3	4198.7	4209.7	4224.0	4239.1	4255.1	4273.9	4289.6	4308.3	4328.0	4348.9		
	5840.2	5858.9	5944.1	6058.5	6173.4	6297.3	6428.1	6565.9	6711.5	6865.1	7027.4		
	3.5322	1.2233	-0.4146	-1.1440	-1.5866	-1.9121	-2.1740	-2.3959	-2.5906	-2.7655	-2.9257		
1120. U-U0 H-H0 (S-S0)/R	4302.9	4309.4	4316.6	4331.3	4346.7	4363.0	4380.0	4398.4	4417.5	4437.7	4459.0		
	5986.6	6005.6	6092.2	6205.6	6325.2	6451.1	6583.9	6724.0	6871.8	7027.8	7192.6		
	3.5805	1.2716	-0.3661	-1.0954	-1.5378	-1.8631	-2.1248	-2.3466	-2.5410	-2.7158	-2.8758		
1140. U-U0 H-H0 (S-S0)/R	4409.9	4412.4	4423.9	4438.9	4454.7	4471.4	4489.0	4507.0	4527.0	4547.7	4569.5		
	6133.3	6152.6	6240.6	6355.9	6477.3	6605.2	6740.1	6882.3	7032.4	7190.7	7358.0		
	3.6282	1.3193	-0.3183	-1.0474	-1.4897	-1.8149	-2.0764	-2.2980	-2.4922	-2.6668	-2.8266		
1160. U-U0 H-H0 (S-S0)/R	4517.3	4519.8	4531.6	4546.9	4563.1	4580.1	4598.1	4617.0	4637.0	4658.1	4680.3		
	6280.4	6300.1	6389.5	6506.5	6629.8	6759.7	6896.6	7041.0	7193.3	7394.0	7523.7		
	3.6752	1.3663	-0.2712	-1.0002	-1.4422	-1.7673	-2.0286	-2.2500	-2.4441	-2.6185	-2.7780		
1180. U-U0 H-H0 (S-S0)/R	4625.0	4627.6	4639.6	4655.3	4671.8	4689.2	4704.6	4726.9	4747.3	4768.8	4791.5		
	6428.0	6447.9	6538.7	6657.5	6782.7	6914.5	7053.5	7200.0	7354.5	7511.6	7689.7		
	3.7216	1.4127	-0.2247	-0.9535	-1.3954	-1.7203	-1.9815	-2.0207	-2.3966	-2.5708	-2.7302		
1200. U-U0 H-H0 (S-S0)/R	4733.2	4735.9	4748.1	4764.1	4781.0	4798.8	4817.5	4837.2	4858.0	4880.0	4903.2		
	6575.9	6596.1	6688.3	6808.9	6936.0	7069.8	7210.8	7359.4	7516.1	7681.5	7856.1		
	3.7673	1.4585	-0.1788	-0.9075	-1.3492	-1.6740	-1.9350	-2.1561	-2.3498	-2.5238	-2.6830		
1220. U-U0 H-H0 (S-S0)/R	4841.8	4844.5	4857.0	4873.3	4890.5	4908.7	4927.8	4947.9	4969.1	4991.5	5015.2		
	6724.2	6744.7	6838.3	6960.7	7089.6	7254.5	7368.4	7519.1	7678.1	7845.8	8022.7		
	3.8125	1.5037	-0.1335	-0.8620	-1.3037	-1.6283	-1.8891	-2.1100	-2.3036	-2.4774	-2.6364		
1240. U-U0 H-H0 (S-S0)/R	4950.7	4953.5	4966.3	4982.9	5000.5	5019.0	5038.5	5059.0	5080.6	5103.5	5127.6		
	6872.9	6893.8	6988.7	7112.9	7243.6	7381.3	7520.4	7679.2	7840.4	8010.4	8189.7		
	3.8571	1.5483	-0.0888	-0.8172	-1.2586	-1.5831	-1.8438	-2.0645	-2.2579	-2.4316	-2.5904		
1260. U-U0 H-H0 (S-S0)/R	5060.1	5063.0	5076.0	5093.0	5110.9	5129.7	5149.6	5170.5	5192.6	5215.8	5240.3		
	7022.1	7043.2	7139.5	7265.5	7398.1	7537.7	7684.7	7839.7	8003.0	8175.3	8357.0		
	3.9011	1.5924	-0.0446	-0.7729	-1.2142	-1.5385	-1.7991	-2.0196	-2.2129	-2.3863	-2.5449		
1280. U-U0 H-H0 (S-S0)/R	5169.9	5172.8	5186.1	5203.4	5221.7	5240.9	5261.1	5282.4	5304.9	5328.5	5353.5		
	7171.6	7193.1	7290.7	7418.4	7552.9	7694.4	7843.5	8000.5	8166.0	8344.6	8524.7		
	3.9447	1.6360	-0.0010	-0.7291	-1.1703	-1.4945	-1.7549	-2.0753	-2.1683	-2.3416	-2.5001		
1300. U-U0 H-H0 (S-S0)/R	5280.1	5283.1	5296.6	5314.3	5332.8	5352.4	5373.0	5394.7	5417.6	5441.7	5467.1		
	7321.6	7343.3	7442.3	7571.8	7708.1	7851.5	8002.6	8161.7	8329.4	8506.2	8692.7		
	3.9877	1.6790	-0.0422	-0.6858	-1.1269	-1.4509	-1.7112	-2.0194	-2.2129	-2.3863	-2.5457		
1320. U-U0 H-H0 (S-S0)/R	5390.7	5393.8	5407.5	5425.5	5444.4	5464.4	5489.3	5507.4	5530.7	5555.2	5581.1		
	7472.0	7494.0	7594.3	7725.6	7863.7	8009.0	8162.1	8323.3	8493.1	8672.2	8861.0		
	4.0302	1.7215	0.0848	-0.6431	-1.0840	-1.4079	-1.6680	-1.8881	-2.0809	-2.2538	-2.4119		
1340. U-U0 H-H0 (S-S0)/R	5501.8	5504.9	5518.9	5537.2	5556.5	5576.7	5598.1	5620.6	5644.2	5669.2	5695.5		
	7622.8	7645.1	7745.8	7879.8	8019.7	8166.9	8321.9	8485.2	8657.2	8838.5	9029.7		
	4.0722	1.7636	0.1270	-0.6008	-1.0416	-1.3654	-1.6254	-1.8453	-2.0379	-2.2107	-2.3666		
1360. U-U0 H-H0 (S-S0)/R	5613.3	5616.4	5630.6	5649.3	5668.9	5685.9	5711.2	5734.1	5758.2	5783.6	5810.3		
	7774.0	7796.6	7899.6	8034.4	8176.1	8325.2	8482.6	8647.5	8821.7	9005.2	9198.7		
	4.1138	1.8052	0.1688	-0.5590	-0.9997	-1.3233	-1.5832	-1.8030	-1.9954	-2.1681	-2.3258		
1380. U-U0 H-H0 (S-S0)/R	5725.1	5728.3	5742.8	5761.8	5781.7	5802.7	5824.8	5848.0	5872.5	5898.3	5925.5		
	7925.6	7948.5	8052.9	8189.4	8332.9	8483.9	8642.9	8810.2	8986.5	9172.2	9368.0		
	4.1549	1.8463	0.2099	-0.5177	-0.9582	-1.2817	-1.5414	-1.7611	-1.9534	-2.1259	-2.2835		
1400. U-U0 H-H0 (S-S0)/R	5837.4	5840.7	5855.4	5874.7	5895.0	5916.3	5938.8	5962.4	5987.3	6014.5	6041.2		
	8077.7	8100.9	8206.6	8344.8	8490.1	8643.0	8803.9	8973.3	9151.7	9339.6	9537.7		
	4.1956	1.8870	0.2506	-0.4768	-0.9172	-1.2406	-1.5001	-1.7197	-1.9118	-2.0842	-2.2416		
1420. U-U0 H-H0 (S-S0)/R	5950.2	5953.4	5968.4	5988.0	6008.7	6030.3	6053.2	6077.2	6102.5	6129.1	6157.2		
	8230.1	8233.6	8300.7	8505.6	8647.7	8802.5	8963.6	9136.7	9317.2	9507.4	9707.8		
	4.2358	1.9273	0.2910	-0.4363	-0.8766	-1.1999	-1.4593	-1.6787	-1.8707	-2.0429	-2.2002		
1440. U-U0 H-H0 (S-S0)/R	6063.3	6066.6	6081.9	6101.8	6122.8	6144.8	6168.0	6192.4	6218.1	6245.1	6273.6		
	8383.0	8406.8	8515.2	8656.8	8805.7	8962.3	9127.1	9300.5	9483.1	9675.9	9878.2		
	4.2757	1.9671	0.3309	-0.3962	-0.8364	-1.1596	-1.4189	-1.6381	-1.8300	-2.0021	-2.1592		
1460. U-U0 H-H0 (S-S0)/R	6176.8	6180.2	6195.7	6216.0	6237.3	6259.6	6283.2	6308.0	6334.0	6361.5	6390.5		
	8536.3	8560.4	8670.1	8815.4	8964.1	9122.6	9289.3	9464.7	9649.4	9844.0	10049.0		
	4.3151	2.0066	0.3705	-0.3566	-0.7967	-1.1197	-1.389	-1.5980	-1.7897	-1.9616	-2.1186		
1480. U-U0 H-H0 (S-S0)/R	6290.8	6294.3	6310.0	6330.6	6352.2	6374.9	6398.8	6424.0	6450.4	6478.3	6507.7		
	8690.1	8714.4	8825.4	8970.5	9127.9	9282.1	9444.3	9614.8	9794.3	9983.1	10182.1	10391.1	
	4.3541	2.0456	0.4096	-0.3174	-0.7573	-1.0802	-1.3393	-1.5583	-1.7499	-1.9216	-2.0785		
1500. U-U0 H-H0 (S-S0)/R	6405.2	6408.7	6424.7	6445.5	6467.5	6490.6	6514.8	6540.4	6567.2	6595.5	6625.3		
	8844.2	8868.9	8981.1	9127.9	9282.1	9445.9	9614.8	9794.3	9983.1	10182.1	10391.1		
	4.3928	2.0843	0.4463	-0.2785	-0.7184	-1.0411	-1.3001	-1.5190	-1.7104	-1.8820	-2.0387		
1520. U-U0 H-H0 (S-S0)/R	6520.0	6523.5	6559.8	6561.0	6583.2	6606.6	6631.3	6655.2	6684.4	6733.2	6743.4		
	8980.7	9025.7	9137.3	9285.7	9441.7	9605.7	9778.2	9956.9	10151.1	10352.1	10563.1		
	4.4310	2.1226	0.4867	-0.2400	-0.6798	-1.0024	-1.2613	-1.4800	-1.6713	-1.8428	-1.9994		

Table 3 (Continued)

RELATIVE INTERNAL ENERGY AND ENTHALPY (CALORIES/GM-MOLE) AND RELATIVE ENTROPY

TEMPERATURE (DEGREE K)	DENSITY (AMAGAT)											
	500.	550.	600.	650.	700.	750.	800.	850.	900.	950.	1000.	
1020. U-UO	3932.1	3993.3	3959.8	3999.6	4024.8	4051.5	4079.9	4109.9	4141.9	4175.9	4212.0	
H-HO	6530.7	6701.0	6881.4	7072.5	7274.7	7489.2	7718.8	7958.3	8214.8	8487.4	8777.3	
(S-SO)/R	-3.2830	-3.4237	-3.5972	-3.6849	-3.8079	-3.9370	-4.0429	-4.1562	-4.2675	-4.3770	-4.4852	
1040. U-UO	4041.3	4063.1	4086.1	4110.4	4136.3	4163.6	4192.7	4223.5	4256.2	4290.9	4327.9	
H-HO	6697.4	6870.5	7053.8	7247.8	7453.3	7671.2	7902.5	8147.5	8407.8	8684.7	8978.5	
(S-SO)/R	-3.2296	-3.3701	-3.5033	-3.6308	-3.7534	-3.8722	-3.9878	-4.1008	-4.2116	-4.3208	-4.4286	
1060. U-UO	4150.8	4173.1	4196.7	4221.6	4246.1	4276.1	4305.8	4337.3	4370.7	4406.3	4444.0	
H-HO	6864.3	7040.2	7226.3	7423.4	7632.1	7853.3	8087.8	8336.7	8600.9	8881.5	9179.8	
(S-SO)/R	-3.1771	-3.3173	-3.4503	-3.5775	-3.6998	-3.8183	-3.9336	-4.0462	-4.1567	-4.2655	-4.3729	
1080. U-UO	4260.7	4283.5	4307.6	4333.1	4360.2	4388.8	4419.2	4451.4	4485.6	4521.9	4560.5	
H-HO	7031.5	7210.2	7391.9	7599.2	7811.0	8035.9	8275.5	8526.0	8794.0	9078.6	9381.0	
(S-SO)/R	-3.1254	-3.2653	-3.3981	-3.5250	-3.6471	-3.7653	-3.8802	-3.9925	-4.1026	-4.2110	-4.3181	
1100. U-UO	4371.0	4394.3	4418.9	4445.0	4472.6	4501.9	4532.9	4565.9	4600.8	4637.9	4677.3	
H-HO	7199.0	7380.3	7572.2	7775.2	7990.2	8217.9	8459.4	8715.4	8987.1	9275.7	9582.2	
(S-SO)/R	-3.0745	-3.2142	-3.3467	-3.4733	-3.5951	-3.7130	-3.8277	-3.9396	-4.0494	-4.1575	-4.2641	
1120. U-UO	4481.5	4505.4	4530.6	4557.2	4585.9	4615.4	4647.4	4680.6	4716.3	4754.1	4794.4	
H-HO	7366.7	7550.8	7745.4	7951.4	8169.5	8400.5	8645.3	8894.9	9180.4	9472.8	9783.4	
(S-SO)/R	-3.0243	-3.1638	-3.2961	-3.4224	-3.5440	-3.6616	-3.7759	-3.8876	-3.9970	-4.1047	-4.2110	
1140. U-UO	4592.5	4616.8	4642.6	4669.8	4698.6	4729.1	4761.5	4795.8	4832.1	4870.8	4911.8	
H-HO	7534.7	7721.4	7918.9	8127.9	8349.0	8583.2	8831.4	9094.6	9373.7	9670.0	9984.7	
(S-SO)/R	-2.9749	-3.1141	-3.2462	-3.3723	-3.4936	-3.6109	-3.7249	-3.8363	-3.9454	-4.0528	-4.1587	
1160. U-UO	4703.8	4728.7	4754.9	4782.7	4812.1	4843.3	4876.3	4911.2	4948.3	4987.7	5029.5	
H-HO	7703.0	7892.4	8092.7	8304.5	8528.8	8766.2	9017.7	9284.4	9567.2	9867.3	10186.	
(S-SO)/R	-2.9261	-3.0652	-3.1970	-3.3228	-3.4439	-3.5609	-3.6747	-3.7857	-3.8946	-4.0016	-4.1072	
1180. U-UO	4815.5	4840.9	4867.7	4896.0	4926.0	4957.8	4991.4	5027.1	5064.9	5105.0	5147.6	
H-HO	8063.6	8266.7	8481.4	8708.7	8949.3	9204.2	9474.3	9760.7	10065.	10387.		
(S-SO)/R	-2.8781	-3.0169	-3.1484	-3.2741	-3.3949	-3.5116	-3.6251	-3.7359	-3.8444	-3.9511	-4.0564	
1200. U-UO	4927.6	4953.5	4980.8	5009.7	5040.3	5072.6	5104.9	5143.2	5181.8	5227.6	5266.0	
H-HO	8040.4	8235.1	8441.0	8658.6	8888.9	9132.6	9390.8	9664.4	9954.4	10262.	10589.	
(S-SO)/R	-2.8307	-2.9693	-3.1006	-3.2260	-3.3165	-3.4363	-3.5763	-3.6867	-3.7950	-3.9114	-4.0063	
1220. U-UO	5040.1	5066.5	5094.3	5123.8	5154.9	5187.9	5222.8	5259.8	5299.0	5340.6	5384.7	
H-HO	8209.6	8404.9	8615.5	8836.0	9069.3	9316.2	9577.6	9854.6	10148.	10460.	10790.	
(S-SO)/R	-2.7839	-2.9223	-3.0534	-3.1785	-3.2988	-3.4151	-3.5280	-3.6383	-3.7462	-3.8523	-3.9569	
1240. U-UO	5153.0	5179.8	5208.2	5238.2	5269.9	5303.5	5339.0	5376.7	5416.6	5458.9	5503.8	
H-HO	8379.1	8579.0	8793.0	9013.7	9250.9	9500.0	9764.7	10045.	10342.	10657.	10992.	
(S-SO)/R	-2.7377	-2.8759	-3.0068	-3.1317	-3.2518	-3.3678	-3.4805	-3.5904	-3.6981	-3.8039	-3.9081	
1260. U-UO	5266.2	5293.6	5322.5	5353.0	5385.3	5419.5	5455.7	5494.0	5534.6	5577.6	5623.3	
H-HO	8548.9	8751.4	8965.9	9191.7	9430.9	9684.0	9951.9	10236.	10536.	10855.	11195.	
(S-SO)/R	-2.6920	-2.8323	-3.0054	-3.1785	-3.2985	-3.4151	-3.5280	-3.6383	-3.7462	-3.8523	-3.9569	
1280. U-UO	5379.9	5407.8	5437.2	5468.2	5501.1	5535.9	5572.7	5611.6	5652.9	5696.7	5743.1	
H-HO	8719.0	8924.1	9140.9	9369.9	9612.1	9868.2	10139.	10426.	10731.	11053.	11395.	
(S-SO)/R	-2.6470	-2.7848	-2.9153	-3.0398	-3.1594	-3.2749	-3.3871	-3.4965	-3.6036	-3.7088	-3.8125	
1300. U-UO	5494.0	5522.3	5552.2	5583.8	5617.3	5652.6	5690.1	5729.7	5771.6	5816.1	5863.3	
H-HO	8889.4	9097.2	9316.6	9548.4	9793.5	10053.	10347.	10617.	10925.	11251.	11597.	
(S-SO)/R	-2.6025	-2.7403	-2.8704	-2.9947	-3.1140	-3.2294	-3.3413	-3.4505	-3.5573	-3.6622	-3.7656	
1320. U-UO	5608.4	5637.3	5667.7	5699.8	5733.8	5769.8	5807.8	5848.1	5890.7	5935.9	5983.8	
H-HO	9060.2	9270.5	9492.6	9727.2	9975.2	10237.	10515.	10809.	11120.	11450.	11799.	
(S-SO)/R	-2.5585	-2.6959	-2.8260	-2.9501	-3.0692	-3.1843	-3.2961	-3.4050	-3.5115	-3.6162	-3.7193	
1340. U-UO	5723.3	5792.6	5783.6	5816.2	5850.8	5887.3	5926.0	5966.9	6010.2	6056.1	6104.8	
H-HO	9231.3	9444.2	9668.9	9906.3	10157.	10422.	10703.	11000.	11315.	11648.	12001.	
(S-SO)/R	-2.5150	-2.6522	-2.7821	-2.9060	-3.0250	-3.1399	-3.2513	-3.3600	-3.4663	-3.5707	-3.6735	
1360. U-UO	5838.6	5868.4	5899.8	5933.0	5968.1	6005.2	6044.5	6086.0	6130.0	6176.6	6226.0	
H-HO	9402.8	9618.1	9845.5	10086.	10339.	10608.	10891.	11192.	11510.	11847.	12204.	
(S-SO)/R	-2.4720	-2.6091	-2.7388	-2.8625	-2.9812	-3.0959	-3.2071	-3.3156	-3.4216	-3.5258	-3.6283	
1380. U-UO	5954.2	5984.5	6016.5	6050.2	6085.9	6123.6	6163.4	6205.6	6250.3	6297.6	6347.7	
H-HO	9574.5	9792.4	10022.	10265.	10522.	10793.	11080.	11384.	11705.	12045.	12406.	
(S-SO)/R	-2.4295	-2.5664	-2.6959	-2.8194	-2.9380	-3.0524	-3.1634	-3.2716	-3.3775	-3.4813	-3.5836	
1400. U-UO	6070.3	6101.1	6133.5	6167.8	6204.0	6242.3	6282.7	6325.5	6370.9	6418.8	6469.7	
H-HO	9746.6	9967.0	10200.	10445.	10705.	10979.	11269.	11576.	11900.	12244.	12609.	
(S-SO)/R	-2.3875	-2.5242	-2.6535	-2.7768	-2.8952	-3.0094	-3.1202	-3.2282	-3.3338	-3.4174	-3.5394	
1420. U-UO	6186.8	6218.0	6251.0	6285.8	6322.5	6361.4	6402.4	6445.9	6491.8	6540.5	6592.1	
H-HO	9919.1	10142.	10577.	10625.	10888.	11165.	11458.	11768.	12096.	12444.	12812.	
(S-SO)/R	-2.3459	-2.4824	-2.6116	-2.7347	-2.8529	-2.9669	-3.0775	-3.1852	-3.2906	-3.3940	-4.3957	
1440. U-UO	6303.7	6339.4	6368.8	6404.2	6441.4	6480.9	6525.5	6566.6	6613.2	6662.6	6714.8	
H-HO	10092.	10317.	10555.	10806.	11071.	11351.	11647.	11961.	12292.	12643.	13015.	
(S-SO)/R	-2.3047	-2.4411	-2.5701	-2.6930	-2.8110	-2.9248	-3.0352	-3.1427	-3.2479	-3.3510	-3.4525	
1460. U-UO	6421.0	6453.2	6487.1	6522.9	6560.8	6600.7	6643.0	6687.7	6734.9	6785.0	6838.0	
H-HO	10265.	10493.	10733.	10987.	11255.	11538.	11857.	12153.	12488.	12842.	13218.	
(S-SO)/R	-2.2640	-2.4002	-2.5290	-2.6518	-2.7696	-2.8832	-2.9934	-3.1007	-3.2056	-3.3085	-3.4097	
1480. U-UO	6538.7	6571.3	6605.8	6642.1	6680.5	6721.0	6763.8	6809.1	6857.1	6907.8	6961.5	
H-HO	10438.	10669.	10912.	11168.	11439.	11725.	12027.	12346.	12684.	13042.	13421.	
(S-SO)/R	-2.2237	-2.3598	-2.4884	-2.6110	-2.7286	-2.8420	-2.9520	-3.0591	-3.1638	-3.2664	-3.3675	
1500. U-UO	6656.8	6689.7	6724.8	6761.7	6800.6	6841.7	6885.1	6931.0	6979.5	7030.9	7085.4	
H-HO	10612.	10845.	11090.	11350.	11623.	11912.	12217.	12540.	12881.	13242.	13624.	
(S-SO)/R	-2.1838	-2.3197	-2.4482	-2.5706	-2.6930	-2.8012	-2.9110	-3.0179	-3.1224	-3.2248	-3.3256	
1520. U-UO	6775.2	6808.8	6844.2	6881.6	6921.1	6962.7	7006.7	7053.2	7102.4	7154.5	7209.6	
H-HO	10786.	11022.	11270.	11531.	11807.	12099.	12407.	12733.	13078.	13442.	13828.	
(S-SO)/R	-2.1443	-2.2800	-2.4084	-2.5306	-2.6478	-2.7609	-2.8705	-2.9772	-3.0814	-3.1836	-3.2842	

(Table continues)

Table 3 (Continued)

RELATIVE INTERNAL ENERGY AND ENTHALPY (CALORIES/GM-MOLE) AND RELATIVE ENTROPY

TEMPERATURE (DEGREE K)	DENSITY (AMAGAT)											
	1050.	1100.	1150.	1200.	1250.	1300.	1350.	1400.	1450.	1500.	1550.	
1020. U-U0 H-H0 (S-S0)/R	4250.4 9085.7 -4.5925	4291.3 9414.0 -4.6990	4334.9 9763.8 -4.8051	4381.3 10137. -4.9110	4430.9 10535. -5.0169	4483.8 10960. -5.1229	4549.3 11413. -5.2294	4600.8 11899. -5.3364	4665.5 12418. -5.4441	4734.9 12975. -5.5527	4809.2 13571. -5.6624	
	4367.1 9291.4 (S-S0)/R	4409.0 9624.4 -4.6415	4453.5 9979.1 -4.7471	4501.0 10357. -4.8525	4551.7 10760. -4.9578	4605.8 11191. -5.0633	4663.5 11651. -5.1692	4725.3 12142. -5.2756	4791.3 12668. -5.3826	4862.1 13232. -5.4905	4937.9 13835. -5.5994	
	4484.2 9497.0 (S-S0)/R	4526.9 9834.6 -4.7493	4572.5 10194. -4.8901	4621.0 10577. -4.7949	4672.7 10986. -4.8989	4727.9 11422. -5.0047	4786.9 11888. -5.1100	4849.9 12358. -5.2158	4917.3 12918. -5.3222	4989.5 13488. -5.4295	5066.8 14099. -5.5376	
1080. U-U0 H-H0 (S-S0)/R	4601.5 9702.6 -4.4241	4645.2 10045. -4.5293	4691.7 10409. -4.6340	4741.2 10797. -4.7384	4794.0 11211. -4.8427	4850.3 11653. -4.9472	4910.5 12124. -5.0519	4974.8 12628. -5.1571	5043.5 13167. -5.2629	5117.1 13743. -5.3694	5195.9 14361. -5.4769	
	4719.2 9908.1 (S-S0)/R	4763.7 10255. -4.3697	4811.1 10624. -4.4745	4861.7 11017. -4.5788	4915.5 11436. -4.6827	4973.0 11883. -4.7866	5034.3 12360. -4.8905	5099.8 12870. -4.9947	5169.9 13415. -5.0993	5244.8 13998. -5.2045	5325.1 14623. -5.3104	
	4837.1 10114. (S-S0)/R	4882.5 10465. -4.3162	4930.9 10838. -4.4206	4982.4 11237. -4.5245	5037.3 11661. -4.6280	5095.9 12113. -4.7313	5158.4 12596. -4.8348	5225.1 13112. -4.9384	5296.5 13663. -5.0425	5372.8 14253. -5.1471	5454.5 14884. -5.2524	
1140. U-U0 H-H0 (S-S0)/R	4955.3 10319. -4.2636	5001.7 10675. -4.3676	5051.0 11053. -4.4710	5103.5 11456. -4.5740	5159.4 11885. -4.6769	5219.1 12343. -4.7799	5282.7 12851. -4.8830	5350.7 13353. -4.9866	5423.3 13910. -5.0906	5501.0 14596. -5.1953	5584.1 15144. -5.3008	
	5073.9 10525. (S-S0)/R	5121.1 10885. -4.2117	5171.3 11268. -4.3153	5224.8 11675. -4.4183	5281.8 12110. -4.5209	5342.5 12573. -4.6234	5407.3 13066. -4.7298	5476.4 13594. -4.9135	5550.3 14157. -5.0350	5629.3 14760. -5.1391	5713.9 15404. -5.2440	
	5192.8 10730. (S-S0)/R	5240.9 11094. -4.1605	5292.0 11482. -4.2637	5346.5 11894. -4.3664	5404.4 12334. -4.4686	5466.2 12802. -4.5706	5532.1 13301. -4.6726	5602.5 13834. -4.7748	5677.6 14404. -4.8773	5758.0 15012. -4.9802	5843.9 15663. -5.0838	
1200. U-U0 H-H0 (S-S0)/R	5312.0 10936. -4.1101	5361.0 11304. -4.2129	5413.0 11696. -4.3152	5468.4 12114. -4.4170	5527.4 12558. -4.5186	5590.2 13031. -4.6201	5657.3 13556. -4.7218	5728.8 14075. -4.8238	5805.2 14650. -4.9263	5886.8 15265. -5.0292	5974.1 15922. -5.1329	
	5431.6 11141. (S-S0)/R	5481.4 11514. -4.0603	5534.4 11911. -4.1628	5590.7 12333. -4.2647	5650.7 12872. -4.3661	5714.6 13260. -4.4673	5782.7 13707. -4.5684	5855.4 14315. -4.6697	5933.0 14896. -4.7712	6015.9 15517. -4.8731	6104.5 16181. -4.9755	
	5551.5 11347. (S-S0)/R	5602.2 11724. -4.0112	5656.0 12125. -4.1134	5713.3 12591. -4.2149	5774.2 13005. -4.3159	5839.2 13489. -4.4167	5908.4 14004. -4.5174	5982.2 14554. -4.6182	6061.0 15141. -4.7192	6145.2 15768. -4.8207	6235.2 16438. -5.0252	
1260. U-U0 H-H0 (S-S0)/R	5671.8 11553. -3.9628	5723.3 11934. -4.0646	5778.0 12339. -4.1658	5836.2 12770. -4.2664	5898.1 13229. -4.3668	5964.1 13718. -4.4671	6034.4 14248. -4.5675	6109.4 14794. -4.6680	6189.4 15386. -4.7690	6274.8 16019. -4.8704	6366.2 16696. -4.9725	
	5792.4 11758. (S-S0)/R	5844.7 12144. -3.9150	5900.3 12554. -4.0165	5959.4 12989. -4.1173	6022.4 13453. -4.2176	6089.3 13946. -4.3176	6160.7 14472. -4.4175	6236.8 15033. -4.5174	6318.0 15631. -4.6175	6404.7 16270. -4.7180	6497.3 16953. -4.8189	
	5913.4 11964. (S-S0)/R	5966.5 12354. -3.8678	6023.0 12698. -3.9690	6083.0 13208. -4.0694	6146.9 13676. -4.1694	6214.9 14175. -4.2690	6287.3 14706. -4.3685	6364.5 15272. -4.4680	6446.9 15876. -4.5677	6534.8 16520. -4.6677	6628.8 17209. -4.7681	
1320. U-U0 H-H0 (S-S0)/R	6034.7 12170. -3.8212	6088.7 12564. -3.9220	6146.0 12982. -4.0221	6206.9 13427. -4.1217	6271.8 13900. -4.2210	6340.8 14403. -4.3201	6414.2 14939. -4.4192	6492.5 15511. -4.5185	6576.1 16120. -4.6180	6665.2 16771. -4.7180	6760.4 17465. -4.8186	
	6156.4 12376. (S-S0)/R	6211.2 12774. -3.7751	6269.4 13197. -3.8756	6331.2 13646. -3.9754	6397.0 14123. -4.0747	6466.9 14632. -4.1736	6541.5 15173. -4.2723	6620.9 15749. -4.3710	6705.5 16364. -4.4699	6795.9 17020. -4.5690	6892.4 17721. -4.6686	
	6278.4 12582. (S-S0)/R	6334.0 12984. -3.7296	6393.1 13441. -3.8298	6455.8 13865. -3.9293	6522.5 14347. -4.0282	6593.5 14860. -4.1268	6659.0 15496. -4.2251	6749.5 15988. -4.3235	6835.3 16508. -4.4219	6926.9 17270. -4.5206	7024.6 17977. -4.6197	
1380. U-U0 H-H0 (S-S0)/R	6404.8 12789. -3.6846	6457.2 13195. -3.7845	6517.1 13626. -3.8837	6580.7 14084. -3.9823	6648.4 14570. -4.0805	6720.3 15088. -4.1785	6790.9 15639. -4.2765	6878.4 16226. -4.3746	6965.4 16852. -4.4728	7058.1 17519. -4.5715	7157.1 18232. -4.6706	
	6523.6 12995. (S-S0)/R	6580.8 13405. -3.7398	6641.5 13840. -3.8387	6706.0 14303. -3.9369	6774.6 14794. -4.0348	6847.5 15316. -4.1325	6925.1 15872. -4.2301	7007.7 16464. -4.3277	7095.8 17096. -4.4256	7189.7 17769. -4.5238	7289.9 18487. -4.6225	
	6646.8 13202. (S-S0)/R	6704.8 13616. -3.5962	6766.3 14055. -3.6955	6831.7 14522. -3.7941	6901.1 15017. -3.8921	6975.0 15544. -3.9896	7053.6 16051. -4.0869	7137.3 16703. -4.1842	7226.4 17339. -4.2815	7321.5 18017. -4.3790	7423.0 18742. -4.4768	
1440. U-U0 H-H0 (S-S0)/R	6770.3 13409. -3.5957	6829.1 13826. -3.6918	6891.4 14270. -3.7950	6957.7 14741. -3.8477	7028.0 15179. -3.9450	7102.8 15688. -4.0419	7182.4 16229. -4.1488	7267.2 16804. -4.2458	7357.4 17416. -4.3436	7453.6 18068. -4.4383	7556.3 18996. -4.5281	
	6894.1 13615. (S-S0)/R	6953.7 14037. -3.5097	7016.9 14485. -3.6085	7084.0 14960. -3.7065	7155.3 15464. -3.8039	7231.0 16001. -3.9008	7311.6 16571. -3.9974	7397.4 17178. -4.0940	7488.7 17825. -4.1905	7586.1 18515. -4.2873	7689.9 19250. -4.3843	
	7018.4 13822. (S-S0)/R	7078.7 14248. -3.4671	7142.7 14700. -3.5657	7210.7 15179. -3.6634	7282.8 15688. -3.7605	7359.5 16229. -3.8571	7441.1 16804. -3.9534	7527.9 17416. -4.0496	7620.3 18068. -4.1458	7718.8 18763. -4.2422	7823.8 19450. -4.3388	
1500. U-U0 H-H0 (S-S0)/R	7143.0 14030. -3.4250	7204.1 14459. -3.5253	7268.9 14915. -3.6208	7337.7 15398. -3.7176	7410.8 15911. -3.8039	7486.4 16457. -3.9008	7570.9 16571. -3.9974	7658.7 17037. -4.0940	7752.2 17654. -4.1905	7851.8 18311. -4.1976	7958.0 19011. -4.2939	
	7268.0 14237. (S-S0)/R	7329.8 14670. -3.3833	7395.5 15130. -3.4814	7465.1 15617. -3.5786	7539.0 16135. -3.6751	7617.5 16685. -3.7711	7701.0 17270. -3.8668	7789.9 17892. -3.9624	7884.4 18554. -4.0579	7985.1 19259. -4.1536	8092.5 20011. -4.3456	
	7329.8 14670. (S-S0)/R	7405.0 15130. -3.3833	7465.1 15617. -3.4814	7539.0 16135. -3.5786	7617.5 16685. -3.6751	7701.0 17270. -3.8668	7789.9 17892. -3.9624	7884.4 18554. -4.0579	7985.1 19259. -4.1536	8092.5 20011. -4.3456		

(Table continues)

Table 3 (Continued)

RELATIVE INTERNAL ENERGY AND ENTHALPY (CALORIES/GM-MOLE) AND RELATIVE ENTRPY

TEMPERATURE (DEGREE K)	DENSITY (AMAGAT)									
	1600.	1650.	1700.	1750.	1800.	1850.	1900.	1950.	2000.	
1020. U-UO	4888.9	4974.5	5066.6	5165.7	5272.4	5387.4	5511.6	5645.8	5791.1	
	H-HO	14212.	14899.	15638.	16433.	17290.	18213.	19211.	20288.	21454.
	(S-SO)/R	-5.7731	-5.8852	-5.9987	-6.1137	-6.2304	-6.3488	-6.4691	-6.5914	-6.7157
1040. U-UO	5019.3	5104.6	5200.5	5301.5	5410.2	5527.4	5653.9	5790.5	5938.3	
	H-HO	14483.	15178.	15926.	16729.	17595.	18526.	19535.	20623.	21799.
	(S-SO)/R	-5.7094	-5.8206	-5.9332	-6.0473	-6.1630	-6.2804	-6.3996	-6.5207	-6.6438
1060. U-UO	5149.8	5238.8	5334.4	5437.3	5548.0	5667.3	5796.1	5935.1	6085.4	
	H-HO	14754.	15457.	16212.	17024.	17899.	18841.	19858.	20956.	22143.
	(S-SO)/R	-5.6468	-5.7573	-5.8690	-5.9822	-6.0969	-6.2133	-6.3314	-6.4514	-6.5732
1080. U-UO	5280.4	5371.1	5468.5	5575.2	5685.9	5807.3	5938.2	6079.5	6232.3	
	H-HO	15023.	15734.	16497.	17318.	18201.	19153.	20179.	21286.	22484.
	(S-SO)/R	-5.5854	-5.6950	-5.8059	-5.9182	-6.0320	-6.1474	-6.2645	-6.3834	-6.5041
1100. U-UO	5411.2	5503.5	5602.6	5709.1	5823.8	5947.2	6080.3	6223.9	6379.1	
	H-HO	15292.	16010.	16782.	17611.	18502.	19463.	20498.	21616.	22823.
	(S-SO)/R	-5.5250	-5.6339	-5.7440	-5.8554	-5.9684	-6.0828	-6.1989	-6.3167	-6.4363
1120. U-UO	5542.1	5636.0	5736.8	5845.2	5961.7	6087.1	6222.3	6368.2	6525.8	
	H-HO	15560.	16286.	17065.	17902.	18802.	19771.	20816.	21943.	23160.
	(S-SO)/R	-5.4656	-5.5738	-5.6831	-5.7937	-5.9058	-6.0193	-6.1345	-6.2513	-6.3698
1140. U-UO	5673.2	5768.7	5811.2	5981.3	6099.7	6227.1	6364.4	6512.5	6672.4	
	H-HO	15828.	16561.	17347.	18192.	19101.	20079.	21132.	22269.	23496.
	(S-SO)/R	-5.4072	-5.5146	-5.6232	-5.7331	-5.8443	-5.9570	-6.0712	-6.1870	-6.3045
1160. U-UO	5804.5	5901.5	6005.7	6117.5	6237.8	6367.1	6500.5	6656.8	6819.0	
	H-HO	16095.	16835.	17629.	18482.	19398.	20385.	21447.	22593.	23830.
	(S-SO)/R	-5.3497	-5.4565	-5.5644	-5.6735	-5.7839	-5.8957	-6.0090	-6.1238	-6.2403
1180. U-UO	5935.9	6034.5	6140.3	6253.9	6375.9	6507.2	6648.6	6801.0	6965.5	
	H-HO	16361.	17108.	17910.	18770.	19695.	20690.	21761.	22916.	24162.
	(S-SO)/R	-5.2932	-5.3993	-5.5064	-5.6148	-5.7244	-5.8354	-5.9478	-6.0617	-6.1773
1200. U-UO	6067.6	6167.7	6275.1	6390.4	6514.2	6647.4	6790.8	6945.3	7112.0	
	H-HO	16626.	17381.	18189.	19058.	19990.	20993.	21273.	23237.	24492.
	(S-SO)/R	-5.2375	-5.3429	-5.4494	-5.555.0	-5.6659	-5.7761	-5.8877	-6.0007	-6.1153
1220. U-UO	6169.4	6301.1	6410.1	6527.0	6652.6	6787.7	6933.0	7089.6	7258.4	
	H-HO	16891.	17652.	18468.	19344.	20285.	21296.	22384.	23557.	24821.
	(S-SO)/R	-5.1926	-5.2874	-5.3933	-5.5002	-5.6083	-5.7177	-5.8285	-5.9407	-6.0543
1240. U-UO	6331.5	6434.7	6545.2	6663.8	6791.2	6928.1	7075.3	7233.9	7404.9	
	H-HO	17156.	17924.	18747.	19630.	20578.	21598.	22694.	23876.	25149.
	(S-SO)/R	-5.1285	-5.2327	-5.3379	-5.4442	-5.5516	-5.6603	-5.7702	-5.8816	-5.9944
1260. U-UO	6464.9	6568.5	6680.6	6800.8	6929.9	7068.6	7217.7	7378.4	7551.5	
	H-HO	17419.	18194.	19025.	19915.	20871.	21898.	23003.	24193.	25475.
	(S-SO)/R	-5.0752	-5.1789	-5.2834	-5.3870	-5.4958	-5.6037	-5.7129	-5.8234	-5.9354
1280. U-UO	6596.4	6702.5	6816.1	6937.9	7068.7	7209.2	7360.2	7522.8	7698.0	
	H-HO	17683.	18464.	19302.	20199.	21163.	22198.	23311.	24509.	25800.
	(S-SO)/R	-5.0227	-5.1257	-5.2297	-5.3347	-5.4407	-5.5479	-5.6564	-5.7662	-5.8773
1300. U-UO	6729.2	6836.7	6951.8	7075.3	7207.7	7349.9	7502.9	7667.4	7844.6	
	H-HO	17946.	18734.	19578.	20483.	21454.	22497.	23618.	24824.	26124.
	(S-SO)/R	-4.9709	-5.0734	-5.1767	-5.2811	-5.3865	-5.4930	-5.6007	-5.7097	-5.8200
1320. U-UO	6862.2	6971.2	7087.8	7212.8	7346.9	7490.9	7645.6	7812.1	7991.3	
	H-HO	18208.	19003.	19854.	20766.	21744.	22795.	23924.	25138.	26446.
	(S-SO)/R	-4.9197	-5.0217	-5.1245	-5.2282	-5.3330	-5.4389	-5.5459	-5.6542	-5.7637
1340. U-UO	6995.5	7105.9	7224.0	7350.5	7486.2	7631.9	7788.5	7956.8	8138.1	
	H-HO	18470.	19271.	20129.	21048.	22034.	23092.	24228.	25451.	26767.
	(S-SO)/R	-4.8693	-4.9707	-5.0729	-5.1761	-5.2802	-5.3855	-5.4919	-5.5994	-5.7081
1360. U-UO	7129.1	7240.8	7360.4	7488.4	7625.8	7773.1	7931.5	8101.7	8284.9	
	H-HO	18732.	19539.	20404.	21330.	22322.	23388.	24532.	25763.	27087.
	(S-SO)/R	-4.8195	-4.9204	-5.0221	-5.1247	-5.2282	-5.3328	-5.4385	-5.5453	-5.6534
1380. U-UO	7262.9	7376.0	7497.0	7626.6	7765.5	7914.5	8074.6	8246.7	8431.8	
	H-HO	18993.	19807.	20678.	21611.	22611.	23663.	24835.	26074.	27406.
	(S-SO)/R	-4.7703	-4.8707	-4.9719	-5.0739	-5.1769	-5.2808	-5.3859	-5.4921	-5.5994
1400. U-UO	7397.0	7511.4	7633.8	7764.9	7905.4	8056.1	8217.9	8391.8	8578.9	
	H-HO	19254.	20074.	20952.	21891.	22898.	23978.	25138.	26384.	27724.
	(S-SO)/R	-4.7218	-4.8217	-4.9223	-5.0238	-5.1262	-5.2296	-5.3340	-5.4395	-5.5461
1420. U-UO	7531.3	7647.1	7770.9	7903.5	8045.5	8197.9	8361.4	8537.1	8726.0	
	H-HO	19515.	20341.	21225.	22171.	23185.	24272.	25439.	26693.	28041.
	(S-SO)/R	-4.6730	-4.7732	-4.8734	-4.9743	-5.0762	-5.1790	-5.2828	-5.3876	-5.4936
1440. U-UO	7665.9	7783.0	7908.2	8042.3	8185.9	8326.4	8481.9	8648.8	8828.0	9020.6
	H-HO	19775.	20607.	21498.	22451.	23471.	24565.	25740.	27001.	28357.
	(S-SO)/R	-4.6264	-4.7254	-4.8250	-4.9255	-5.0268	-5.1290	-5.2322	-5.3364	-5.4418
1460. U-UO	7800.8	7919.2	8045.8	8181.3	8326.4	8481.9	8648.8	8828.0	9020.6	
	H-HO	20035.	20874.	21770.	22729.	23757.	24858.	26040.	27309.	28672.
	(S-SO)/R	-4.5796	-4.6781	-4.7773	-4.8772	-4.9780	-5.0796	-5.1823	-5.2859	-5.3906
1480. U-UO	7935.9	8055.7	8183.6	8320.6	8467.2	8624.3	8792.8	8973.7	9168.1	
	H-HO	20295.	21139.	22042.	23008.	24042.	25150.	26239.	27615.	28987.
	(S-SO)/R	-4.5333	-4.6313	-4.7301	-4.8295	-4.9298	-5.0309	-5.1330	-5.2360	-5.3401
1500. U-UO	8071.4	8192.4	8321.7	8460.1	8608.1	8766.8	8936.9	9119.6	9315.8	
	H-HO	20554.	21405.	22314.	23286.	24327.	25442.	26563.	27921.	29300.
	(S-SO)/R	-4.4875	-4.5852	-4.6834	-4.7824	-4.8821	-4.9827	-5.0843	-5.1867	-5.2902
1520. U-UO	8207.1	8329.4	8460.0	8599.8	8749.3	8909.5	9081.3	9265.6	9463.6	
	H-HO	20813.	21670.	22985.	23563.	24611.	25733.	26935.	28226.	29612.
	(S-SO)/R	-4.4423	-4.5395	-4.6373	-4.7358	-4.8351	-4.9352	-5.0361	-5.1380	-5.2409

(Table continues)

Table 3 (Continued)

RELATIVE INTERNAL ENERGY AND ENTHALPY (CALORIES/GM-MOLE) AND RELATIVE ENTRPY

TEMPERATURE (DEGREES K)	DENSITY (AMAGAT)										
	1.	10.	50.	100.	150.	200.	250.	300.	350.	400.	450.
1540. U-UO H-HO (S-S0)/R	6635.2	6638.8	6655.2	6676.8	6699.4	6723.1	6748.1	6774.4	6802.1	6831.2	6861.8
	9153.7	9184.9	9293.8	9444.0	9601.7	9767.5	9941.9	10125.	10318.	10521.	10735.
	4.4689	2.1605	0.5247	-0.2019	-0.6416	-0.9641	-1.2228	-1.4444	-1.6326	-1.8140	-1.9604
1560. U-UO H-HO (S-S0)/R	6750.8	6754.4	6771.1	6793.0	6815.9	6840.0	6865.4	6892.0	6920.1	6949.6	6980.7
	9309.0	9334.6	9420.8	9602.6	9762.1	9929.7	10108.	10291.	10486.	10692.	10908.
	4.5065	2.1980	0.5624	-0.1642	-0.6037	-0.9261	-1.1847	-1.4032	-1.5943	-1.7655	-1.9218
1580. U-UO H-HO (S-S0)/R	6866.8	6870.5	6887.5	6909.6	6932.9	6957.3	6983.0	7010.0	7038.5	7068.4	7099.9
	9464.8	9490.6	9608.1	9761.6	9922.9	10092.	10270.	10458.	10655.	10862.	11081.
	4.5437	2.2353	0.5996	-0.1268	-0.5662	-0.8885	-1.1470	-1.3654	-1.5563	-1.7274	-1.8836
1600. U-UO H-HO (S-S0)/R	6983.2	6987.0	7004.2	7026.6	7050.2	7075.0	7101.0	7126.4	7157.3	7187.6	7219.5
	9621.0	9647.1	9765.9	9921.0	10084.	10255.	10435.	10625.	10824.	11033.	11254.
	4.5805	2.2721	0.6366	-0.0897	-0.5291	-0.8513	-1.1956	-1.3279	-1.5187	-1.6897	-1.8457
1620. U-UO H-HO (S-S0)/R	7100.0	7103.8	7121.3	7144.0	7166.0	7193.1	7219.5	7247.3	7276.5	7307.2	7339.5
	9777.5	9803.9	9924.0	10081.	10246.	10419.	10601.	10792.	10993.	11205.	11427.
	4.6171	2.3087	0.6732	-0.0530	-0.4922	-0.8143	-1.026	-1.2908	-1.4815	-1.6623	-1.8082
1640. U-UO H-HO (S-S0)/R	7217.2	7221.1	7238.8	7261.9	7286.1	7311.6	7338.3	7366.5	7396.0	7427.2	7459.9
	9934.5	9961.2	10083.	10241.	10407.	10582.	10766.	10959.	11163.	11376.	11601.
	4.6533	2.3449	0.7095	-0.0166	-0.4558	-0.7778	-1.0359	-1.2539	-1.4445	-1.6152	-1.7710
1660. U-UO H-HO (S-S0)/R	7334.8	7338.8	7356.7	7380.1	7404.6	7430.4	7457.5	7486.0	7516.0	7541.5	7580.7
	10092.	10119.	10241.	10402.	10570.	10746.	10932.	11127.	11332.	11548.	11762.
	4.6891	2.3808	0.7455	-0.0194	-0.4196	-0.7415	-0.9995	-1.2174	-1.4079	-1.5785	-1.7341
1680. U-UO H-HO (S-S0)/R	7452.8	7456.3	7475.0	7498.7	7525.3	7549.7	7577.1	7606.0	7636.4	7668.3	7701.9
	10220.	10277.	10401.	10563.	10732.	10911.	11098.	11296.	11493.	11717.	11950.
	4.7247	2.4164	0.7811	-0.0552	-0.3837	-0.7055	-0.9635	-1.1813	-1.3716	-1.5421	-1.6976
1700. U-UO H-HO (S-S0)/R	7571.2	7575.2	7593.6	7617.6	7642.8	7669.3	7697.1	7726.4	7757.1	7789.4	7823.4
	10408.	10435.	10560.	10724.	10896.	11076.	11265.	11464.	11673.	11893.	12125.
	4.7600	2.4517	0.8165	0.0906	-0.3482	-0.6699	-0.9277	-1.1454	-1.3357	-1.5060	-1.6614
1720. U-UO H-HO (S-S0)/R	7690.0	7694.1	7712.7	7737.0	7762.5	7789.3	7817.5	7847.1	7878.2	7910.9	7945.4
	10566.	10594.	10721.	10886.	11059.	11241.	11432.	11633.	11844.	12066.	12300.
	4.7749	2.4866	0.8515	0.1258	-0.3130	-0.6346	-0.8923	-1.1099	-1.3000	-1.4703	-1.6255
1740. U-UO H-HO (S-S0)/R	7809.1	7813.3	7832.1	7856.8	7882.6	7909.7	7938.3	7966.2	7999.7	8032.8	8067.7
	10725.	10753.	10881.	11048.	11223.	11407.	11587.	11767.	11952.	12141.	12476.
	4.8296	2.5213	0.8863	0.1606	-0.2780	-0.5995	-0.8572	-1.0746	-1.2647	-1.4348	-1.5899
1760. U-UO H-HO (S-S0)/R	7928.6	7932.8	7951.9	7976.9	8003.0	8030.5	8059.4	8089.7	8121.6	8155.1	8190.3
	10884.	10913.	11042.	11210.	11387.	11572.	11767.	11957.	12187.	12414.	12652.
	4.8640	2.5557	0.9208	0.1952	-0.2434	-0.5648	-0.8223	-1.0397	-1.2296	-1.3996	-1.5546
1780. U-UO H-HO (S-S0)/R	8048.5	8052.8	8072.1	8097.4	8123.9	8151.7	8180.9	8211.6	8243.8	8277.7	8313.4
	11044.	11073.	11203.	11373.	11551.	11739.	11935.	12124.	12312.	12502.	12828.
	4.8981	2.5989	0.9549	0.2294	-0.2090	-0.5303	-0.7878	-1.0050	-1.1948	-1.3647	-1.5196
1800. U-UO H-HO (S-S0)/R	8168.8	8173.1	8192.7	8218.2	8245.0	8273.2	8302.7	8333.8	8366.4	8400.7	8436.8
	11204.	11233.	11365.	11536.	11716.	11905.	12104.	12302.	12502.	12762.	13004.
	4.9191	2.6237	0.9889	0.2634	-0.1749	-0.4961	-0.7535	-0.9707	-1.1604	-1.3301	-1.4849
1820. U-UO H-HO (S-S0)/R	8289.4	8293.8	8313.6	8339.5	8366.6	8395.1	8425.0	8456.4	8489.4	8524.0	8560.5
	11365.	11394.	11526.	11700.	11882.	12072.	12273.	12483.	12704.	12937.	13181.
	4.9655	2.6572	1.0225	0.2971	-0.1411	-0.4623	-0.7195	-0.9366	-1.1262	-1.2958	-1.4505
1840. U-UO H-HO (S-S0)/R	8410.5	8414.9	8434.9	8461.1	8488.5	8517.3	8547.5	8579.3	8612.7	8647.7	8684.6
	11525.	11555.	11689.	11864.	12047.	12240.	12442.	12654.	12877.	13112.	13558.
	4.9988	2.6905	1.0559	0.3306	-0.1076	-0.4286	-0.6858	-0.9027	-1.0922	-1.2618	-1.4164
1860. U-UO H-HO (S-S0)/R	8531.8	8536.3	8556.6	8583.0	8610.8	8639.9	8670.5	8702.6	8736.3	8771.8	8809.1
	11686.	11716.	11851.	12028.	12213.	12407.	12611.	12826.	13035.	13287.	13536.
	5.0318	2.7236	1.0890	0.3638	-0.0743	-0.3953	-0.6223	-0.8692	-1.0586	-1.2281	-1.3825
1880. U-UO H-HO (S-S0)/R	8653.5	8658.0	8678.6	8705.3	8733.4	8762.9	8793.8	8826.3	8860.4	8896.2	8933.9
	11848.	11878.	12014.	12192.	12379.	12575.	12781.	12997.	13224.	13463.	13713.
	5.0646	2.7564	1.1218	0.3967	-0.0413	-0.3622	-0.6191	-0.8397	-1.0252	-1.1946	-1.3489
1900. U-UO H-HO (S-S0)/R	8775.6	8780.2	8800.9	8828.0	8856.4	8886.2	8917.4	8950.3	8984.7	9021.0	9059.0
	12010.	12040.	12178.	12357.	12546.	12744.	12951.	13169.	13398.	13639.	13891.
	5.0971	2.7889	1.1544	0.4294	-0.0085	-0.3293	-0.5862	-0.8029	-0.9921	-1.1613	-1.3156
1920. U-UO H-HO (S-S0)/R	8898.0	8902.6	8923.6	8951.0	8979.7	9009.8	9041.4	9074.6	9109.4	9146.0	9184.5
	12172.	12202.	12431.	12523.	12713.	12912.	13122.	13342.	13572.	13815.	14070.
	5.1293	2.8212	1.1867	0.4618	0.0240	-0.2967	-0.5935	-0.7701	-0.9592	-1.1284	-1.2825
1940. U-UO H-HO (S-S0)/R	9020.8	9025.5	9046.7	9074.3	9103.4	9133.8	9165.7	9199.3	9234.5	9271.5	9310.4
	12334.	12365.	12505.	12688.	12880.	13081.	13293.	13514.	13747.	13991.	14248.
	5.1614	2.8532	1.2188	0.4940	0.0562	-0.2644	-0.5211	-0.7376	-0.9266	-1.0956	-1.2497
1960. U-UO H-HO (S-S0)/R	9143.9	9148.6	9170.1	9198.0	9227.4	9258.1	9290.4	9324.3	9359.9	9397.2	9436.5
	12497.	12528.	12670.	12894.	13048.	13251.	13464.	13687.	13922.	14168.	14427.
	5.1931	2.8850	1.2507	0.5259	0.0882	-0.2323	-0.4889	-0.7053	-0.8942	-1.0632	-1.2171
1980. U-UO H-HO (S-S0)/R	9267.4	9272.1	9293.8	9322.1	9351.7	9382.8	9415.4	9449.7	9485.6	9521.3	9563.0
	12660.	12692.	12835.	13021.	13216.	13420.	13645.	13860.	14097.	14346.	14607.
	5.2247	2.9166	1.2823	0.5576	0.1200	-0.2004	-0.4969	-0.6733	-0.8621	-1.0309	-1.1848
2000. U-UO H-HO (S-S0)/R	9391.1	9396.0	9417.9	9446.4	9476.4	9507.8	9540.8	9575.3	9611.6	9649.8	9689.8
	12824.	12856.	13000.	13187.	13384.	13590.	13807.	14034.	14273.	14523.	14786.
	5.2560	2.9479	1.3137	0.5891	0.1515	-0.1688	-0.4252	-0.6415	-0.8302	-0.9990	-1.1527
2020. U-UO H-HO (S-S0)/R	9515.3	9520.1	9542.3	9571.1	9601.4	9633.1	9666.4	9701.4	9738.0	9776.5	9817.0
	12984.	13020.	13165.	13354.	13553.	13761.	13979.	14208.	14448.	14701.	14966.
	5.2871	2.9790	1.3449	0.6203	0.1829	-0.1374	-0.3938	-0.6099	-0.7985	-0.9672	-1.1208
2040. U-UO H-HO (S-S0)/R	9639.7	9644.6	9667.0	9696.2	9726.7	9758.8	9792.4	9827.7	9864.7	9903.6	9944.5
	13152.	13184.	13331.	13521.	13721.	13931.	14121.	14382.	14624.	14879.	15146.
	5.3180	3.0099	1.3758	0.6513	0.2139	-0.1063	-0.3025	-0.5786	-0.7671	-0.9557	-1.0892

(Table continues)

Table 3 (Continued)

RELATIVE INTERNAL ENERGY AND ENTHALPY (CALORIES/GM-MOLE) AND RELATIVE ENTROPY

TEMPERATURE (DEGREE K.)	DENSITY (AMAGAT)											
	500.	550.	600.	650.	700.	750.	800.	850.	900.	950.	1000.	
1540. U-U0 6894.1 6928.2 6964.1 7002.0 7041.9 7084.1 7128.7 7175.8 7225.7 7278.4 7334.2	H-H0 10961. 11198. 11449. 11713. 11992. 12287. 12598. 12927. 13275. 13642. 14032.	(S-S0)/R -2.1052 -2.2408 -2.3689 -2.4910 -2.6080 -2.7209 -2.8303 -2.9368 -3.0409 -3.1429 -3.2432										
1560. U-U0 7013.4 7047.9 7084.3 7122.7 7163.2 7205.9 7251.1 7298.8 7349.3 7402.7 7459.2	H-H0 11136. 11376. 11629. 11896. 12177. 12475. 12789. 13121. 13472. 13845. 14236.	(S-S0)/R -2.0664 -2.2019 -2.3299 -2.4518 -2.5687 -2.6814 -2.7906 -2.8969 -3.0007 -3.1025 -3.2026										
1580. U-U0 7133.1 7168.1 7204.9 7243.8 7284.8 7328.1 7373.9 7422.2 7473.3 7527.3 7584.5	H-H0 11311. 11553. 11809. 12078. 12363. 12663. 12980. 13315. 13669. 14044. 14440.	(S-S0)/R -2.0281 -2.1634 -2.2912 -2.4129 -2.5297 -2.6422 -2.7512 -2.8573 -2.9609 -3.0625 -3.1624										
1600. U-U0 7253.2 7288.6 7325.9 7365.3 7406.9 7450.7 7497.0 7545.9 7597.7 7652.3 7710.2	H-H0 11486. 11731. 11989. 12261. 12548. 12851. 13171. 13509. 13867. 14245. 14644.	(S-S0)/R -1.9901 -2.1252 -2.2529 -2.3745 -2.4910 -2.6034 -2.7122 -2.8181 -2.9216 -3.0229 -3.1226										
1620. U-U0 7373.6 7409.5 7447.3 7487.2 7529.3 7573.7 7620.5 7670.1 7722.4 7777.7 7836.3	H-H0 11662. 11909. 12170. 12445. 12734. 13040. 13363. 13704. 14065. 14446. 14849.	(S-S0)/R -1.9524 -2.0874 -2.2149 -2.3364 -2.4527 -2.5649 -2.6736 -2.7793 -2.8826 -3.0832										
1640. U-U0 7494.4 7530.8 7569.1 7609.5 7652.1 7697.0 7744.4 7794.5 7847.5 7903.5 7962.7	H-H0 11838. 12088. 12351. 12628. 12921. 13229. 13555. 13899. 14263. 14647. 15054.	(S-S0)/R -1.9151 -2.0499 -2.1773 -2.2986 -2.4148 -2.5268 -2.6553 -2.7409 -2.8439 -2.9449 -3.0441										
1660. U-U0 7615.7 7652.5 7691.2 7732.1 7775.2 7820.7 7868.7 7919.4 7973.0 8029.6 8089.5	H-H0 12015. 12267. 12532. 12812. 13107. 13418. 13747. 14094. 14461. 14849. 15259.	(S-S0)/R -1.8781 -2.0128 -2.1400 -2.2612 -2.3772 -2.4891 -2.5974 -2.7028 -2.8056 -2.9064 -3.0055										
1680. U-U0 7737.3 7774.5 7813.8 7855.1 7898.7 7944.8 7993.3 8044.6 8098.8 8156.0 8216.6	H-H0 12192. 12446. 12714. 12996. 13294. 13608. 13940. 14290. 14660. 15050. 15464.	(S-S0)/R -1.8414 -1.9760 -2.1031 -2.2241 -2.3400 -2.4517 -2.5599 -2.6650 -2.7677 -2.8683 -2.9671										
1700. U-U0 7859.2 7896.9 7936.7 7978.5 8022.6 8069.2 8118.3 8170.2 8225.0 8282.9 8344.1	H-H0 12369. 12625. 12896. 13181. 13481. 13798. 14132. 14485. 14858. 15252. 15669.	(S-S0)/R -1.8051 -1.9393 -2.0665 -2.1873 -2.3031 -2.4146 -2.5262 -2.6276 -2.7301 -2.8305 -2.9292										
1720. U-U0 7981.6 8019.7 8059.9 8102.3 8146.9 8194.0 8243.7 8296.1 8351.5 8410.0 8471.9	H-H0 12546. 12805. 13078. 13365. 13668. 13988. 14325. 14681. 15057. 15455. 15875.	(S-S0)/R -1.7691 -1.9034 -2.0302 -2.1509 -2.2665 -2.3779 -2.4857 -2.5906 -2.6929 -2.7931 -2.8915										
1740. U-U0 8104.3 8142.9 8183.6 8226.4 8271.5 8319.1 8369.4 8422.4 8478.4 8537.5 8600.1	H-H0 12724. 12985. 13260. 13550. 13856. 14178. 14518. 14877. 15256. 15657. 16080.	(S-S0)/R -1.7334 -1.8675 -1.9942 -2.1148 -2.2302 -2.3415 -2.4491 -2.5538 -2.6580 -2.7560 -2.8542										
1760. U-U0 8227.4 8266.5 8307.6 8350.9 8396.5 8444.7 8495.4 8549.0 8605.6 8665.4 8728.6	H-H0 12902. 13166. 13443. 13736. 14044. 14369. 14712. 15074. 15456. 15840. 16286.	(S-S0)/R -1.6979 -1.8320 -1.9586 -2.0790 -2.1943 -2.3054 -2.4129 -2.5174 -2.6193 -2.7192 -2.8173										
1780. U-U0 8350.9 8390.4 8431.9 8475.7 8521.9 8570.5 8621.9 8676.0 8733.2 8793.6 8857.5	H-H0 13080. 13346. 13626. 13921. 14232. 14560. 14906. 15270. 15655. 16062. 16492.	(S-S0)/R -1.6628 -1.7968 -1.9232 -2.0435 -2.1584 -2.2696 -2.3769 -2.4813 -2.5831 -2.6827 -2.7806										
1800. U-U0 8474.7 8514.6 8556.6 8600.9 8647.6 8696.8 8748.6 8803.4 8861.1 8922.2 8986.7	H-H0 13259. 13527. 13810. 14107. 14421. 14751. 15099. 15467. 15855. 16265. 16699.	(S-S0)/R -1.6280 -1.7618 -1.8861 -2.0083 -2.1233 -2.2341 -2.3413 -2.4454 -2.5471 -2.6466 -2.7443										
1820. U-U0 8598.9 8639.2 8681.7 8726.5 8773.6 8823.3 8875.7 8931.0 8989.4 9051.1 9116.2	H-H0 13438. 13709. 13939. 14293. 14609. 14942. 15294. 15664. 16055. 16469. 16905.	(S-S0)/R -1.5935 -1.7272 -1.8533 -1.9733 -2.0882 -2.1989 -2.3059 -2.4099 -2.5114 -2.6107 -2.7082										
1840. U-U0 8723.4 8764.2 8807.1 8852.4 8900.0 8950.2 9003.2 9059.1 9118.0 9180.3 9246.0	H-H0 13617. 13890. 14177. 14480. 14798. 15134. 15488. 15862. 16256. 16672. 17112.	(S-S0)/R -1.5592 -1.6928 -1.8188 -1.9387 -2.0535 -2.1639 -2.2708 -2.3747 -2.4760 -2.5752 -2.6725										
1860. U-U0 8848.3 8889.5 8932.9 8978.6 9026.8 9077.5 9131.0 9187.4 9247.0 9309.8 9376.2	H-H0 13797. 14072. 14362. 14666. 14988. 15326. 15683. 16059. 16456. 16876. 17318.	(S-S0)/R -1.5252 -1.6587 -1.7846 -1.9043 -2.0190 -2.1293 -2.2361 -2.3398 -2.4409 -2.5399 -2.6371										
1880. U-U0 8973.5 9015.2 9059.0 9105.2 9153.8 9205.1 9259.1 9316.1 9376.2 9439.7 9506.8	H-H0 13977. 14254. 14546. 14853. 15177. 15518. 15870. 16257. 16657. 17079. 17525.	(S-S0)/R -1.4915 -1.6248 -1.7506 -1.8703 -1.9848 -2.0950 -2.2016 -2.3051 -2.4061 -2.5050 -2.6020										
1900. U-U0 9099.1 9143.2 9185.5 9232.1 9281.3 9333.0 9387.6 9445.1 9505.8 9569.9 9637.6	H-H0 14157. 14437. 14731. 15041. 15367. 15711. 16073. 16455. 16858. 17283. 17733.	(S-S0)/R -1.4581 -1.5913 -1.7170 -1.8365 -1.9508 -2.0609 -2.1674 -2.2708 -2.3716 -2.4703 -2.5671										
1920. U-U0 9225.0 9267.5 9312.3 9359.4 9409.0 9461.3 9516.4 9574.5 9635.8 9700.4 9768.7	H-H0 14358. 14620. 14916. 15285. 15557. 15903. 16268. 16653. 17059. 17488. 17940.	(S-S0)/R -1.4249 -1.5580 -1.6835 -1.8029 -1.9171 -2.0271 -2.1334 -2.2367 -2.3374 -2.4359 -2.5325										
1940. U-U0 9351.2 9394.2 9439.4 9487.0 9537.1 9589.9 9645.5 9704.2 9766.0 9831.3 9900.2	H-H0 14519. 14803. 15101. 15416. 15747. 16096. 16464. 16852. 17260. 17692. 18148.	(S-S0)/R -1.3920 -1.5249 -1.6504 -1.7696 -1.8837 -1.9935 -2.0997 -2.2029 -2.3034 -2.4017 -2.4982										
1960. U-U0 9477.8 9521.2 9566.9 9614.9 9665.5 9718.8 9775.0 9834.1 9896.6 9962.5 10032.	H-H0 14700. 14986. 15287. 15604. 15938. 16289. 16660. 17050. 17462. 17897. 18355.	(S-S0)/R -1.3593 -1.4922 -1.6175 -1.7366 -1.8506 -1.9603 -2.0663 -2.1693 -2.2697 -2.3679 -2.4642										
1980. U-U0 9604.7 9648.5 9694.6 9743.2 9794.2 9848.0 9904.7 9964.5 10027. 10094. 10164.	H-H0 14881. 15170. 15473. 15792. 16129. 16483. 16856. 17249. 17664. 18101. 18563.	(S-S0)/R -1.3268 -1.4596 -1.5848 -1.7038 -1.8177 -1.9272 -2.0331 -2.1360 -2.2362 -2.3343 -2.4305										
2000. U-U0 9731.9 9776.2 9822.8 9871.7 9923.3 9977.6 10035. 10095. 10159. 10226. 10290.	H-H0 15063. 15353. 15659. 15981. 16320. 16676. 17052. 17448. 17866. 18306. 18771.	(S-S0)/R -1.2947 -1.4273 -1.5524 -1.6713 -1.7850 -1.8945 -2.0002 -2.1029 -2.2031 -2.3009 -2.3970										
2020. U-U0 9859.5 9904.2 9951.2 10001. 10053. 10107. 10165. 10226. 10290. 10358. 10429.	H-H0 15245. 15538. 15846. 16170. 16511. 16870. 17249. 17648. 18068. 18512. 18980.	(S-S0)/R -1.2627 -1.3953 -1.5202 -1.6390 -1.7526 -1.8619 -1.9676 -2.0702 -2.1701 -2.2679 -2.3637										
2040. U-U0 9987.4 10032. 10080. 10130. 10182. 10238. 10296. 10357. 10422. 10490. 10562.	H-H0 15427. 15722. 16032. 16359. 16703. 17064. 17446. 17847. 18270. 18717. 19188.	(S-S0)/R -1.2310 -1.3634 -1.4883 -1.6070 -1.7205 -1.8296 -1.9352 -2.0376 -2.1374 -2.2350 -2.3307										

(Table continues)

Table 3 (Continued)

RELATIVE INTERNAL ENERGY AND ENTHALPY (CALORIES/GM-MOLE) AND RELATIVE ENTROPY

TEMPERATURE (DEGREE K.)	DENSITY (AMAGAT)											
	1050.	1100.	1150.	1200.	1250.	1300.	1350.	1400.	1450.	1500.	1550.	
1540. U-UO	7393.3	7455.9	7522.3	7592.8	7667.6	7747.1	7831.5	7921.3	8016.9	8118.8	8227.3	
H-HO	14444.	14881.	15345.	15837.	16359.	16913.	17502.	18129.	18796.	19517.	20264.	
(S-SO)/R	-3.3421	-3.4399	-3.5368	-3.6331	-3.7288	-3.8242	-3.9195	-4.0147	-4.1100	-4.2055	-4.3013	
1560. U-UO	7519.0	7582.4	7649.6	7720.9	7796.5	7876.9	7962.3	8053.1	8149.8	8252.7	8362.4	
H-HO	14652.	15093.	15560.	16056.	16582.	17141.	17735.	18367.	19039.	19755.	20517.	
(S-SO)/R	-3.3013	-3.3988	-3.4955	-3.5915	-3.6869	-3.7820	-3.8770	-3.9719	-4.0668	-4.1620	-4.2574	
1580. U-UO	7645.1	7709.2	7777.2	7849.3	7925.8	8007.1	8093.4	8185.2	8282.9	8386.9	8497.7	
H-HO	14860.	15304.	15776.	16276.	16806.	17369.	17968.	18604.	19281.	20002.	20770.	
(S-SO)/R	-3.2609	-3.3582	-3.4546	-3.5503	-3.6455	-3.7403	-3.8349	-3.9295	-4.0241	-4.1189	-4.2140	
1600. U-UO	7771.5	7836.4	7905.1	7978.0	8055.4	8137.6	8224.9	8317.6	8416.4	8521.4	8633.3	
H-HO	15068.	15516.	15991.	16495.	17030.	17597.	18201.	18842.	19524.	20250.	21023.	
(S-SO)/R	-3.2208	-3.3179	-3.4141	-3.5095	-3.6044	-3.6990	-3.7933	-3.8876	-3.9819	-4.0763	-4.1711	
1620. U-UO	7898.2	7963.9	8033.4	8107.1	8185.4	8268.4	8356.4	8450.4	8550.1	8656.2	8769.3	
H-HO	15276.	15728.	16207.	16715.	17254.	17826.	18433.	19079.	19766.	20497.	21276.	
(S-SO)/R	-3.1812	-3.2781	-3.3740	-3.4692	-3.5638	-3.6581	-3.7521	-3.8461	-3.9400	-4.0342	-4.1286	
1640. U-UO	8025.4	8091.7	8162.0	8236.6	8315.7	8399.6	8488.7	8583.4	8684.2	8791.4	8905.5	
H-HO	15484.	15940.	16423.	16935.	17478.	18054.	18666.	19337.	20008.	20744.	21528.	
(S-SO)/R	-3.1419	-3.2386	-3.3342	-3.4292	-3.5236	-3.6176	-3.7113	-3.8050	-3.8986	-3.9925	-4.0865	
1660. U-UO	8152.8	8219.9	8291.0	8366.4	8446.3	8531.1	8621.1	8716.8	8818.5	8926.8	9042.0	
H-HO	15693.	16152.	16639.	17155.	17702.	18282.	18899.	19554.	20250.	20991.	21780.	
(S-SO)/R	-3.1030	-3.1994	-3.2949	-3.3896	-3.4837	-3.5774	-3.6709	-3.7643	-3.8576	-3.9511	-4.0449	
1680. U-UO	8280.7	8348.5	8420.3	8496.5	8577.2	8662.9	8753.8	8850.5	8953.2	9062.5	9178.8	
H-HO	15901.	16364.	16855.	17375.	17926.	18511.	19132.	19791.	20493.	21239.	22033.	
(S-SO)/R	-3.0645	-3.1607	-3.2559	-3.3504	-3.4442	-3.5377	-3.6309	-3.7240	-3.8170	-3.9102	-4.0036	
1700. U-UO	8408.8	8477.4	8550.0	8626.9	8708.5	8795.0	8886.9	8984.5	9088.2	9198.5	9315.9	
H-HO	16110.	16577.	17071.	17595.	18150.	18739.	19364.	20029.	20735.	21486.	22285.	
(S-SO)/R	-3.0263	-3.1223	-3.2173	-3.3115	-3.4051	-3.4983	-3.5913	-3.6841	-3.7768	-3.8697	-3.9628	
1720. U-UO	8537.4	8606.6	8680.0	8757.7	8840.1	8927.5	9020.2	9118.8	9223.4	9334.8	9453.3	
H-HO	16319.	16789.	17287.	17815.	18374.	18967.	19597.	20266.	20977.	21732.	22537.	
(S-SO)/R	-2.9895	-3.0842	-3.1790	-3.2730	-3.3664	-3.4593	-3.5520	-3.6445	-3.7370	-3.8296	-3.9223	
1740. U-UO	8666.2	8736.2	8810.3	8888.8	8972.0	9060.3	9153.9	9253.3	9359.0	9471.4	9590.9	
H-HO	16528.	17002.	17504.	18035.	18598.	19196.	19830.	20503.	21219.	21979.	22789.	
(S-SO)/R	-2.9510	-3.0465	-3.1411	-3.2349	-3.3280	-3.4207	-3.5131	-3.6054	-3.6976	-3.7898	-3.8823	
1760. U-UO	8795.4	8866.1	8941.0	9020.2	9104.3	9193.3	9287.9	9388.2	9494.9	9608.2	9728.8	
H-HO	16737.	17215.	17720.	18256.	18823.	19424.	20063.	20741.	21461.	22226.	23040.	
(S-SO)/R	-2.9138	-3.0092	-3.1035	-3.1970	-3.2900	-3.3824	-3.4746	-3.5666	-3.6585	-3.7505	-3.8426	
1780. U-UO	8925.0	8996.4	9071.9	9152.0	9236.8	9326.8	9422.2	9523.5	9631.0	9745.4	9867.0	
H-HO	16947.	17428.	17937.	18476.	19047.	19653.	20296.	20978.	21702.	22473.	23292.	
(S-SO)/R	-2.8770	-2.9721	-3.0662	-3.1596	-3.2523	-3.3445	-3.4384	-3.5281	-3.6198	-3.7115	-3.8033	
1800. U-UO	9054.8	9126.9	9203.3	9284.1	9369.7	9460.5	9556.8	9659.0	9767.5	9882.8	10006.	
H-HO	17157.	17641.	18154.	18697.	19272.	19882.	20529.	21215.	21944.	22719.	23543.	
(S-SO)/R	-2.8495	-2.9354	-3.0293	-3.1224	-3.2149	-3.3069	-3.3985	-3.4900	-3.5814	-3.6728	-3.7644	
1820. U-UO	9185.0	9257.8	9334.9	9416.5	9502.9	9594.5	9691.6	9794.8	9904.2	10021.	10144.	
H-HO	17366.	17854.	18371.	18917.	19497.	20110.	20762.	21452.	22186.	22966.	23795.	
(S-SO)/R	-2.8042	-2.8990	-2.9927	-3.0856	-3.1778	-3.2696	-3.3610	-3.4522	-3.5433	-3.6445	-3.7258	
1840. U-UO	9315.6	9389.1	9466.8	9549.2	9636.4	9728.8	9826.8	9930.8	10041.	10159.	10283.	
H-HO	17576.	18068.	18588.	19138.	19721.	20359.	20994.	21690.	22428.	23212.	24046.	
(S-SO)/R	-2.7683	-2.8629	-2.9564	-3.0491	-3.1411	-3.2326	-3.3238	-3.4148	-3.5056	-3.5965	-3.6875	
1860. U-UO	9446.4	9520.6	9599.1	9682.2	9770.2	9863.5	9962.3	10067.	10179.	10297.	10423.	
H-HO	17786.	18281.	18805.	19359.	19946.	20568.	21228.	21927.	22670.	23459.	24298.	
(S-SO)/R	-2.7327	-2.8271	-2.9204	-3.0129	-3.1047	-3.1960	-3.2870	-3.3777	-3.4683	-3.5589	-3.6496	
1880. U-UO	9577.6	9652.5	9731.7	9815.5	9904.3	9998.4	10098.	10204.	10316.	10435.	10562.	
H-HO	17997.	18495.	19022.	19580.	20171.	20797.	21461.	22165.	22912.	23705.	24549.	
(S-SO)/R	-2.6974	-2.7916	-2.8847	-2.9770	-3.0686	-3.1597	-3.2504	-3.3409	-3.4312	-3.5216	-3.6120	
1900. U-UO	9709.1	9784.7	9864.6	9949.2	10039.	10134.	10234.	10341.	10454.	10574.	10702.	
H-HO	18207.	18709.	19240.	19801.	20396.	21026.	21694.	22402.	23154.	23952.	24800.	
(S-SO)/R	-2.6624	-2.7564	-2.8493	-2.9414	-3.0328	-3.1237	-3.2142	-3.3044	-3.3945	-3.4846	-3.5748	
1920. U-UO	9840.9	9917.2	9997.8	10083.	10173.	10269.	10371.	10478.	10592.	10713.	10842.	
H-HO	18418.	18923.	19457.	20023.	20621.	21255.	21927.	22639.	23395.	24198.	25051.	
(S-SO)/R	-2.6276	-2.7215	-2.8142	-2.9061	-2.9973	-3.0879	-3.1782	-3.2682	-3.3581	-3.4479	-3.5378	
1940. U-UO	9973.0	10050.	10131.	10217.	10308.	10405.	10507.	10616.	10731.	10853.	10983.	
H-HO	18629.	19137.	19675.	20244.	20846.	21484.	22160.	22877.	23637.	24444.	25302.	
(S-SO)/R	-2.5932	-2.6868	-2.7794	-2.8711	-2.9621	-3.0525	-3.1426	-3.2323	-3.3220	-3.4116	-3.5012	
1960. U-UO	10105.	10183.	10265.	10352.	10444.	10541.	10644.	10753.	10869.	10992.	11123.	
H-HO	18840.	19392.	19893.	20466.	21072.	21713.	22393.	23114.	23879.	24691.	25553.	
(S-SO)/R	-2.5590	-2.6525	-2.7448	-2.8363	-2.9271	-3.0174	-3.1072	-3.2068	-3.3062	-3.4043	-3.5393	
1980. U-UO	10238.	10316.	10399.	10487.	10579.	10677.	10781.	10892.	11008.	11132.	11264.	
H-HO	19051.	19566.	20111.	20687.	21297.	21943.	22627.	23352.	24121.	24937.	25804.	
(S-SO)/R	-2.5251	-2.6184	-2.7106	-2.8019	-2.8925	-2.9825	-3.0721	-3.1615	-3.2507	-3.3398	-3.4289	
2000. U-UO	10371.	10450.	10534.	10622.	10715.	10814.	10919.	11030.	11148.	11273.	11405.	
H-HO	19262.	19781.	20329.	20909.	21522.	22172.	22860.	23589.	24363.	25183.	26055.	
(S-SO)/R	-2.4914	-2.5845	-2.6766	-2.7677	-2.8581	-2.9479	-3.0374	-3.1265	-3.2154	-3.3143	-3.3578	
2020. U-UO	10505.	10584.	10668.	10757.	10851.	10951.	11057.	11169.	11287.	11413.	11547.	
H-HO	19474.	19996.	20547.	21131.	21748.	22401.	23093.	23827.	24604.	25430.	26306.	
(S-SO)/R	-2.4580	-2.5510	-2.6428	-2.7338	-2.8240	-2.9136	-3.0028	-3.0918	-3.1805	-3.2691	-3.3578	
2040. U-UO	10638.	10718.	10803.	10898.	10988.	11088.	11195.	11307.	11427.	11554.	11688.	
H-HO	19685.	20211.	20766.	21353.	21974.	22631.	23327.	24064.	24846.	25676.	26556.	
(S-SO)/R	-2.4249	-2.5177	-2.6094	-2.7001	-2.7902	-2.8796	-2.9686	-3.0573	-3.1458	-3.2442	-3.3227	

(Table continues)

Table 3 (Continued)

RELATIVE INTERNAL ENERGY AND ENTHALPY (CALORIES/GM-MOLE) AND RELATIVE ENTROPY

TEMPERATURE (DEGREE K)	DENSITY(AMAGAT)									
	1600.	1650.	1700.	1750.	1800.	1850.	1900.	1950.	2000.	
1540. U-UO H-HO (S-S0)/R	8343.0	8466.6	8598.6	8739.7	8880.7	9052.5	9225.8	9411.8	9611.5	
	21072.	21934.	22856.	23840.	24894.	26023.	27233.	28530.	29924.	
	-4.3976	-4.4943	-4.5917	-4.6897	-4.7885	-4.8881	-4.9886	-5.0899	-5.1922	
1560. U-UO H-HO (S-S0)/R	8479.3	8604.1	8737.4	8879.9	9032.4	9195.6	9370.5	9558.2	9759.6	
	21331.	22199.	23126.	24117.	25177.	26313.	27529.	28834.	30235.	
	-4.3533	-4.4497	-4.5466	-4.6442	-4.7425	-4.8416	-4.9416	-5.0424	-5.1441	
1580. U-UO H-HO (S-S0)/R	8619.8	8741.9	8865.5	9020.4	9174.2	9339.0	9515.4	9704.7	9907.8	
	21589.	22463.	23396.	24394.	25460.	26602.	27825.	29137.	30545.	
	-4.3095	-4.4055	-4.5020	-4.5992	-4.6970	-4.7957	-4.8951	-4.9954	-5.0966	
1600. U-UO H-HO (S-S0)/R	8752.7	8880.0	9015.9	9161.1	9316.3	9482.5	9660.5	9851.4	10056.	
	21848.	22727.	23666.	24669.	25742.	26891.	28121.	29440.	30855.	
	-4.2662	-4.3618	-4.4579	-4.5546	-4.6520	-4.7502	-4.8492	-4.9490	-5.0496	
1620. U-UO H-HO (S-S0)/R	8889.8	9018.3	9155.4	9320.0	9458.7	9626.3	9802.8	9998.3	10205.	
	22106.	22991.	23936.	24945.	26024.	27179.	28416.	29741.	31164.	
	-4.2233	-4.3185	-4.4142	-4.5106	-4.6075	-4.7052	-4.8037	-4.9030	-5.0032	
1640. U-UO H-HO (S-S0)/R	9027.1	9156.9	9295.3	9443.2	9601.2	9770.3	9951.4	10145.	10354.	
	22363.	23254.	24205.	25220.	26306.	27467.	28710.	30043.	31472.	
	-4.1809	-4.2757	-4.3710	-4.4670	-4.5635	-4.6608	-4.7588	-4.8576	-4.9572	
1660. U-UO H-HO (S-S0)/R	9164.8	9295.7	9445.4	9584.6	9744.0	9914.5	10097.	10293.	10502.	
	22621.	23517.	24474.	25495.	26587.	27754.	29004.	30343.	31779.	
	-4.1389	-4.2334	-4.3283	-4.4238	-4.5199	-4.6168	-4.7143	-4.8127	-4.9118	
1680. U-UO H-HO (S-S0)/R	9302.7	9434.8	9575.8	9726.2	9887.0	10059.	10243.	10440.	10651.	
	22879.	23781.	24743.	25770.	26867.	28041.	29297.	30443.	32086.	
	-4.0973	-4.1914	-4.2860	-4.3811	-4.4768	-4.5732	-4.6704	-4.7682	-4.8669	
1700. U-UO H-HO (S-S0)/R	9440.9	9574.2	9716.4	9868.1	10030.	10204.	10389.	10588.	10801.	
	23136.	24043.	25011.	26044.	27148.	28328.	29590.	30943.	32392.	
	-4.0561	-4.1499	-4.2441	-4.3388	-4.4342	-4.5301	-4.6268	-4.7242	-4.8224	
1720. U-UO H-HO (S-S0)/R	9579.4	9713.9	9857.2	10010.	10174.	10348.	10535.	10736.	10950.	
	23393.	24306.	25279.	26318.	27428.	28614.	29883.	31242.	32698.	
	-4.0154	-4.1088	-4.2026	-4.2970	-4.3919	-4.4875	-4.5838	-4.6807	-4.7784	
1740. U-UO H-HO (S-S0)/R	9718.2	9853.8	9998.4	10153.	10317.	10494.	10682.	10884.	11100.	
	23650.	24568.	25547.	26592.	27707.	28900.	30175.	31540.	33003.	
	-3.9750	-4.0681	-4.1616	-4.2556	-4.3501	-4.4453	-4.5411	-4.6377	-4.7349	
1760. U-UO H-HO (S-S0)/R	9857.2	9994.0	10140.	10295.	10461.	10639.	10829.	11032.	11249.	
	23907.	24831.	25815.	26865.	27897.	29185.	30467.	31838.	33308.	
	-3.9350	-4.0277	-4.1209	-4.2145	-4.3087	-4.4035	-4.4989	-4.5950	-4.6918	
1780. U-UO H-HO (S-S0)/R	9996.5	10134.	10281.	10438.	10606.	10784.	10976.	11180.	11399.	
	24164.	25093.	26083.	27138.	28266.	29470.	30758.	32136.	33612.	
	-3.8954	-3.9878	-4.0806	-4.1739	-4.2677	-4.3621	-4.4571	-4.5528	-4.6492	
1800. U-UO H-HO (S-S0)/R	10136.	10275.	10423.	10581.	10750.	10930.	11123.	11329.	11549.	
	24421.	25355.	26350.	27411.	28454.	29755.	31048.	32433.	33915.	
	-3.8561	-3.9482	-4.0407	-4.1336	-4.2271	-4.3211	-4.4157	-4.5110	-4.6070	
1820. U-UO H-HO (S-S0)/R	10276.	10416.	10565.	10725.	10895.	11076.	11270.	11477.	11700.	
	24677.	25616.	26617.	27684.	28823.	30039.	31359.	32729.	34218.	
	-3.8172	-3.9090	-4.0012	-4.0938	-4.1869	-4.2805	-4.3748	-4.4697	-4.5652	
1840. U-UO H-HO (S-S0)/R	10416.	10557.	10708.	10868.	11039.	11222.	11418.	11626.	11850.	
	24933.	25878.	26884.	27957.	29101.	30323.	31629.	33026.	34521.	
	-3.7767	-3.8702	-3.9620	-4.0543	-4.1470	-4.2403	-4.3342	-4.4287	-4.5238	
1860. U-UO H-HO (S-S0)/R	10556.	10699.	10850.	11012.	11184.	11369.	11565.	11776.	12001.	
	25196.	26139.	27151.	28229.	29379.	30607.	31919.	33321.	34823.	
	-3.7465	-3.8317	-3.9232	-4.0151	-4.1075	-4.2005	-4.2940	-4.3881	-4.4828	
1880. U-UO H-HO (S-S0)/R	10697.	10840.	10993.	11156.	11330.	11515.	11713.	11925.	12151.	
	25446.	26400.	27417.	28501.	29566.	30890.	32208.	33617.	35124.	
	-3.7026	-3.7935	-3.8847	-3.9763	-4.0684	-4.1610	-4.2542	-4.3479	-4.4422	
1900. U-UO H-HO (S-S0)/R	10838.	10982.	11136.	11300.	11475.	11662.	11861.	12074.	12302.	
	25702.	26662.	27684.	28773.	29934.	31173.	32497.	33912.	35425.	
	-3.6651	-3.7557	-3.8466	-3.9379	-4.0297	-4.1219	-4.2147	-4.3081	-4.4020	
1920. U-UO H-HO (S-S0)/R	10979.	11125.	11280.	11445.	11621.	11809.	12010.	12224.	12454.	
	25958.	26923.	27950.	29044.	30211.	31456.	32785.	34206.	35726.	
	-3.6279	-3.7182	-3.8088	-3.8998	-3.9912	-4.0832	-4.1756	-4.2686	-4.3622	
1940. U-UO H-HO (S-S0)/R	11120.	11267.	11423.	11590.	11767.	11956.	12158.	12374.	12605.	
	26214.	27183.	28216.	29315.	30488.	31738.	33074.	34500.	36026.	
	-3.5910	-3.6810	-3.7714	-3.8621	-3.9532	-4.0447	-4.1368	-4.2295	-4.3227	
1960. U-UO H-HO (S-S0)/R	11262.	11410.	11567.	11735.	11913.	12104.	12307.	12524.	12756.	
	26469.	27444.	28482.	29587.	30764.	32020.	33361.	34794.	36326.	
	-3.5545	-3.6442	-3.7342	-3.8246	-3.9154	-4.0067	-4.0984	-4.1907	-4.2836	
1980. U-UO H-HO (S-S0)/R	11404.	11553.	11711.	11880.	12060.	12251.	12456.	12674.	12908.	
	26725.	27705.	28747.	29858.	31041.	32302.	33649.	35088.	36625.	
	-3.5182	-3.6077	-3.6974	-3.7875	-3.8780	-3.9690	-4.0004	-4.1523	-4.2449	
2000. U-UO H-HO (S-S0)/R	11546.	11696.	11856.	12025.	12206.	12399.	12605.	12825.	13060.	
	26981.	27965.	29013.	30128.	31317.	32584.	33936.	35381.	36924.	
	-3.4822	-3.5714	-3.6609	-3.7507	-3.8409	-3.9315	-4.0227	-4.1143	-4.2064	
2020. U-UO H-HO (S-S0)/R	11689.	11840.	12000.	12171.	12353.	12547.	12754.	12976.	13212.	
	27236.	28226.	29278.	30399.	31593.	32865.	34223.	35673.	37223.	
	-3.4466	-3.5355	-3.6247	-3.7142	-3.8041	-3.8945	-3.9853	-4.0765	-4.1684	
2040. U-UO H-HO (S-S0)/R	11831.	11983.	12145.	12317.	12500.	12696.	12904.	13126.	13364.	
	27492.	28486.	29494.	30669.	31868.	33147.	34510.	35966.	37521.	
	-3.4112	-3.4999	-3.5888	-3.6781	-3.7677	-3.8577	-3.9482	-4.0391	-4.1306	

(Table continues)

Table 3 (Continued)

RELATIVE INTERNAL ENERGY AND ENTHALPY (CALORIES/GM-MOLE) AND RELATIVE ENTROPY

TEMPERATURE (DEGREE K.)	DENSITY (AMAGAT)										
	1.	10.	50.	100.	150.	200.	250.	300.	350.	400.	450.
2060. U-U0 9764.5 9769.4 9792.0 9821.5 9852.4 9884.8 9918.7 9954.3 9991.7 10031. 10072.											
H-H0 13317. 13349. 13497. 13689. 13891. 14102. 14324. 14557. 14801. 15057. 15326.											
(S-S0)/R 5.3486 3.0405 1.4065 0.6821 0.2448 -0.0753 -0.3315 -0.5475 -0.7359 -0.9044 -1.0578											
2080. U-U0 9889.6 9894.6 9917.4 9947.2 9978.4 10011. 10045. 10081. 10119. 10159. 10200.											
H-H0 13481. 13514. 13663. 13857. 14060. 14273. 14497. 14731. 14977. 15236. 15507.											
(S-S0)/R 5.3790 3.0710 1.4370 0.7127 0.2754 -0.0446 -0.3007 -0.5166 -0.7050 -0.8734 -1.0267											
2100. U-U0 10015. 10020. 10043. 10073. 10105. 10138. 10172. 10209. 10247. 10287. 10329.											
H-H0 13647. 13680. 13830. 14025. 14230. 14445. 14670. 14906. 15154. 15415. 15688.											
(S-S0)/R 5.4092 3.1012 1.4673 0.7430 0.3058 -0.0141 -0.2701 -0.4859 -0.6742 -0.8425 -0.9958											
2120. U-U0 10141. 10146. 10169. 10199. 10231. 10265. 10300. 10336. 10375. 10415. 10457.											
H-H0 13812. 13845. 13997. 14194. 14400. 14617. 14844. 15082. 15332. 15594. 15869.											
(S-S0)/R 5.4392 3.1312 1.4973 0.7731 0.3361 0.0162 -0.2398 -0.4555 -0.6437 -0.8119 -0.9650											
2140. U-U0 10267. 10272. 10295. 10326. 10358. 10392. 10427. 10464. 10503. 10544. 10586.											
H-H0 13978. 14011. 14164. 14362. 14571. 14789. 15018. 15257. 15509. 15773. 16051.											
(S-S0)/R 5.4690 3.1610 1.5272 0.8031 0.3660 0.0462 -0.2096 -0.4253 -0.6134 -0.7815 -0.9345											
2160. U-U0 10393. 10398. 10422. 10453. 10485. 10519. 10555. 10592. 10631. 10673. 10716.											
H-H0 14144. 14178. 14331. 14532. 14741. 14961. 15192. 15433. 15687. 15953. 16233.											
(S-S0)/R 5.4986 3.1906 1.5568 0.8328 0.3958 0.0761 -0.1797 -0.3952 -0.5833 -0.7513 -0.9043											
2180. U-U0 10520. 10525. 10549. 10580. 10613. 10647. 10683. 10721. 10760. 10802. 10845.											
H-H0 14310. 14344. 14499. 14701. 14912. 15134. 15366. 15610. 15865. 16153. 16415.											
(S-S0)/R 5.5280 3.2200 1.5863 0.8623 0.4254 0.1058 -0.1499 -0.3654 -0.5534 -0.7213 -0.8742											
2200. U-U0 10647. 10652. 10676. 10708. 10741. 10775. 10812. 10850. 10890. 10931. 10975.											
H-H0 14477. 14511. 14667. 14871. 15084. 15307. 15541. 15786. 16043. 16313. 16597.											
(S-S0)/R 5.5571 3.2492 1.6155 0.8916 0.4548 0.1352 -0.1204 -0.3358 -0.5237 -0.6916 -0.8443											
2220. U-U0 10774. 10779. 10804. 10835. 10869. 10904. 10940. 10979. 11019. 11061. 11106.											
H-H0 14644. 14679. 14836. 15041. 15255. 15480. 15716. 15963. 16222. 16494. 16779.											
(S-S0)/R 5.5861 3.2782 1.6445 0.9207 0.4840 0.1645 -0.0911 -0.3064 -0.4942 -0.6620 -0.8147											
2240. U-U0 10901. 10907. 10931. 10964. 10997. 11032. 11069. 11108. 11149. 11191. 11236.											
H-H0 14811. 14846. 15005. 15211. 15427. 15654. 15891. 16140. 16401. 16675. 16962.											
(S-S0)/R 5.6149 3.3070 1.6734 0.9496 0.5130 0.1935 -0.0620 -0.2772 -0.4649 -0.6326 -0.7852											
2260. U-U0 11029. 11035. 11060. 11092. 11126. 11161. 11199. 11238. 11279. 11322. 11367.											
H-H0 14979. 15014. 15174. 15382. 15599. 15827. 16067. 16317. 16580. 16856. 17145.											
(S-S0)/R 5.6435 3.3356 1.7021 0.9783 0.5948 0.2224 -0.0330 -0.2482 -0.4358 -0.6034 -0.7560											
2280. U-U0 11157. 11163. 11188. 11221. 11255. 11291. 11328. 11368. 11409. 11452. 11498.											
H-H0 15147. 15182. 15343. 15592. 15772. 16002. 16242. 16495. 16760. 17037. 17329.											
(S-S0)/R 5.6719 3.3640 1.7305 1.0069 0.5704 0.2511 -0.0403 -0.2194 -0.4069 -0.5745 -0.7269											
2300. U-U0 11286. 11291. 11317. 11350. 11384. 11420. 11458. 11498. 11540. 11583. 11629.											
H-H0 15315. 15350. 15512. 15723. 15944. 16176. 16418. 16673. 16939. 17219. 17512.											
(S-S0)/R 5.7002 3.4922 1.7588 1.0352 0.5988 0.2795 0.0243 -0.1908 -0.3782 -0.5457 -0.6980											
2320. U-U0 11414. 11420. 11446. 11479. 11514. 11550. 11588. 11628. 11670. 11714. 11761.											
H-H0 15483. 15519. 15682. 15895. 16117. 16351. 16595. 16851. 17119. 17401. 17696.											
(S-S0)/R 5.7282 3.4203 1.7869 1.0634 0.6270 0.3078 0.0526 -0.1623 -0.3497 -0.5171 -0.6694											
2340. U-U0 11543. 11549. 11575. 11608. 11643. 11680. 11719. 11759. 11802. 11846. 11893.											
H-H0 15652. 15688. 15852. 16067. 16291. 16525. 16771. 17029. 17299. 17585. 17880.											
(S-S0)/R 5.7561 3.4481 1.8148 1.0914 0.6551 0.3360 0.0808 -0.1341 -0.3214 -0.4887 -0.6409											
2360. U-U0 11673. 11678. 11704. 11738. 11774. 11811. 11850. 11890. 11933. 11978. 12025.											
H-H0 15821. 15877. 16023. 16238. 16464. 16701. 16948. 17208. 17480. 17765. 18064.											
(S-S0)/R 5.7837 3.4798 1.8426 1.1192 0.6829 0.3639 0.1088 -0.1060 -0.2932 -0.4604 -0.6126											
2380. U-U0 11802. 11808. 11834. 11868. 11904. 11941. 11980. 12022. 12065. 12110. 12157.											
H-H0 15970. 16027. 16194. 16411. 16618. 16876. 17125. 17387. 17660. 17948. 18249.											
(S-S0)/R 5.8112 3.5034 1.8701 1.1468 0.7106 0.3916 0.1367 -0.0781 -0.2653 -0.4324 -0.5844											
2400. U-U0 11932. 11938. 11964. 11998. 12034. 12072. 12112. 12153. 12197. 12242. 12290.											
H-H0 16160. 16197. 16364. 16583. 16812. 17052. 17303. 17566. 17841. 18130. 18433.											
(S-S0)/R 5.8386 3.5307 1.8975 1.1742 0.7381 0.4192 0.1643 -0.0504 -0.2375 -0.4045 -0.5565											
2420. U-U0 12062. 12068. 12094. 12129. 12165. 12203. 12243. 12285. 12329. 12375. 12423.											
H-H0 16329. 16367. 16536. 16756. 16986. 17228. 17480. 17745. 18022. 18313. 18618.											
(S-S0)/R 5.8657 3.5579 1.9247 1.2015 0.7655 0.4466 0.1918 -0.0228 -0.2099 -0.3769 -0.5287											
2440. U-U0 12129. 12198. 12225. 12260. 12296. 12335. 12375. 12417. 12461. 12507. 12556.											
H-H0 16499. 16537. 16707. 16929. 17161. 17404. 17658. 17925. 18204. 18497. 18804.											
(S-S0)/R 5.8927 3.5849 1.9518 1.2286 0.7926 0.4739 0.2191 0.0045 -0.1824 -0.3493 -0.5011											
2460. U-U0 12323. 12329. 12356. 12391. 12428. 12467. 12507. 12549. 12594. 12640. 12689.											
H-H0 16670. 16707. 16879. 17102. 17336. 17580. 17836. 18104. 18385. 18680. 18989.											
(S-S0)/R 5.9195 3.6117 1.9787 1.2556 0.8196 0.5009 0.2462 0.0317 -0.1551 -0.3220 -0.4737											
2480. U-U0 12453. 12459. 12487. 12522. 12560. 12599. 12639. 12682. 12727. 12774. 12823.											
H-H0 16840. 16878. 17051. 17276. 17511. 17757. 18015. 18284. 18567. 18864. 19175.											
(S-S0)/R 5.9462 3.6384 2.0054 1.8283 0.8465 0.5278 0.2732 0.0588 -0.1280 -0.2948 -0.4465											
2500. U-U0 12584. 12591. 12618. 12654. 12691. 12731. 12772. 12815. 12860. 12909. 12957.											
H-H0 17011. 17049. 17223. 17449. 17686. 17934. 18193. 18465. 18749. 19048. 19360.											
(S-S0)/R 5.9727 3.6649 2.0319 1.8090 0.8731 0.5545 0.3000 0.0856 -0.1011 -0.2678 -0.4194											
2520. U-U0 12716. 12722. 12750. 12786. 12824. 12863. 12905. 12948. 12993. 13041. 13091.											
H-H0 17182. 17221. 17596. 17623. 17861. 18111. 18372. 18645. 18932. 19232. 19546.											
(S-S0)/R 5.9990 3.6912 2.0583 1.8354 0.8996 0.5811 0.3266 0.1123 -0.0744 -0.2410 -0.3925											
2540. U-U0 12847. 12853. 12881. 12918. 12956. 12996. 13038. 13081. 13127. 13175. 13225.											
H-H0 17353. 17392. 17568. 17767. 17961. 18037. 18288. 18551. 18826. 19114. 19416.											
(S-S0)/R 6.0252 3.7174 2.0846 1.8367 0.9260 0.6075 0.3531 0.1389 -0.0477 -0.2143 -0.3657											
2560. U-U0 12979. 12985. 13014. 13050. 13089. 13129. 13171. 13215. 13261. 13309. 13360.											
H-H0 17525. 17564. 17741. 17972. 18213. 18466. 18730. 19007. 19297. 19601. 19919.											
(S-S0)/R 6.0512 3.7434 2.1106 1.8378 0.9522 0.6338 0.3794 0.1652 -0.0213 -0.1878 -0.3392											

(Table continues)

Table 3 (Continued)

RELATIVE INTERNAL ENERGY AND ENTHALPY (CALORIES/GM-MOLE) AND RELATIVE ENTROPY

TEMPERATURE (DEGREE K)		DENSITY (AMAGAT)										
		>00.	550.	600.	650.	700.	750.	800.	850.	900.	950.	1000.
2060.	U-U0	10116.	10161.	10209.	10259.	10312.	10368.	10427.	10489.	10554.	10623.	10695.
	H-H0	15609.	15907.	16219.	16548.	16894.	17259.	17643.	18047.	18473.	18922.	19397.
	(S-S0)/R	-1.1995	-1.3319	-1.4566	-1.5752	-1.6886	-1.7976	-1.9030	-2.0053	-2.1050	-2.2024	-2.2980
2080.	U-U0	10244.	10290.	10358.	10389.	10443.	10499.	10558.	10621.	10686.	10756.	10829.
	H-H0	15792.	16092.	16407.	16738.	17087.	17453.	17840.	18247.	18676.	19128.	19605.
	(S-S0)/R	-1.1683	-1.3005	-1.4252	-1.5436	-1.6569	-1.7658	-1.8711	-1.9732	-2.0728	-2.1701	-2.2655
2100.	U-U0	10373.	10419.	10468.	10519.	10573.	10630.	10690.	10753.	10819.	10889.	10963.
	H-H0	15975.	16277.	16594.	16928.	17279.	17648.	18037.	18447.	18879.	19354.	19814.
	(S-S0)/R	-1.1372	-1.2694	-1.3939	-1.5123	-1.6254	-1.7342	-1.8394	-1.9414	-2.0408	-2.1380	-2.2333
2120.	U-U0	10502.	10549.	10598.	10650.	10704.	10761.	10822.	10885.	10952.	11023.	11097.
	H-H0	16159.	16462.	16782.	17118.	17471.	17843.	18235.	18647.	19082.	19540.	20024.
	(S-S0)/R	-1.1064	-1.2385	-1.3629	-1.4811	-1.5942	-1.7029	-1.8079	-1.9098	-2.0091	-2.1161	-2.2013
2140.	U-U0	10631.	10679.	10728.	10780.	10835.	10893.	10954.	11018.	11085.	11157.	11232.
	H-H0	16342.	16648.	16970.	17308.	17664.	18039.	18433.	18848.	19258.	19747.	20233.
	(S-S0)/R	-1.0758	-1.2078	-1.3321	-1.4502	-1.5632	-1.6717	-1.7766	-1.8784	-1.9776	-2.0745	-2.1695
2160.	U-U0	10761.	10809.	10859.	10911.	10967.	11025.	11086.	11151.	11219.	11291.	11366.
	H-H0	16526.	16834.	17158.	17499.	17857.	18234.	18631.	19049.	19489.	19953.	20442.
	(S-S0)/R	-1.0455	-1.1773	-1.3016	-1.4196	-1.5324	-1.6408	-1.7450	-1.8473	-1.9463	-2.0431	-2.1379
2180.	U-U0	10891.	10939.	10990.	11043.	11099.	11157.	11219.	11284.	11353.	11425.	11501.
	H-H0	16710.	17020.	17347.	17690.	18050.	18430.	18829.	19250.	19693.	20160.	20652.
	(S-S0)/R	-1.0153	-1.1471	-1.2712	-1.3891	-1.5018	-1.6102	-1.7148	-1.8164	-1.9153	-2.0119	-2.1066
2200.	U-U0	11021.	11070.	11121.	11174.	11231.	11290.	11352.	11418.	11487.	11560.	11637.
	H-H0	16894.	17207.	17535.	17881.	18244.	18626.	19028.	19451.	19897.	20366.	20862.
	(S-S0)/R	-0.9854	-1.1170	-1.2411	-1.3589	-1.4715	-1.5797	-1.6842	-1.7857	-1.8844	-1.9809	-2.0755
2220.	U-U0	11152.	11201.	11252.	11306.	11363.	11423.	11486.	11552.	11621.	11695.	11772.
	H-H0	17079.	17394.	17724.	18072.	18437.	18822.	19226.	19652.	20101.	20573.	21072.
	(S-S0)/R	-0.9556	-1.0872	-1.2111	-1.3288	-1.4413	-1.5494	-1.6539	-1.7552	-1.8538	-1.9502	-2.0446
2240.	U-U0	11283.	11332.	11384.	11438.	11496.	11556.	11619.	11686.	11756.	11830.	11908.
	H-H0	17264.	17541.	17914.	18263.	18631.	19018.	19425.	19854.	20305.	20781.	21282.
	(S-S0)/R	-0.9261	-1.0575	-1.1814	-1.2990	-1.4114	-1.5194	-1.6237	-1.7249	-1.8234	-1.9197	-2.0140
2260.	U-U0	11414.	11464.	11516.	11571.	11629.	11689.	11753.	11820.	11891.	11966.	12044.
	H-H0	17449.	17768.	18103.	18459.	18825.	19215.	19624.	20056.	20510.	20988.	21492.
	(S-S0)/R	-0.8967	-1.0281	-1.1518	-1.2693	-1.3816	-1.4895	-1.5937	-1.6948	-1.7932	-1.8894	-1.9835
2280.	U-U0	11546.	11596.	11648.	11704.	11762.	11823.	11887.	11955.	12026.	12101.	12180.
	H-H0	17634.	17955.	18293.	18647.	19020.	19411.	19824.	20258.	20714.	21195.	21703.
	(S-S0)/R	-0.8676	-0.9988	-1.1225	-1.2399	-1.3521	-1.4599	-1.5640	-1.6650	-1.7632	-1.8592	-1.9533
2300.	U-U0	11677.	11728.	11781.	11837.	11895.	11957.	12022.	12090.	12162.	12237.	12317.
	H-H0	17820.	18143.	18483.	18839.	19214.	19608.	20023.	20460.	20919.	21403.	21913.
	(S-S0)/R	-0.8386	-0.9698	-1.0934	-1.2107	-1.3228	-1.4305	-1.5344	-1.6353	-1.7335	-1.8293	-1.9233
2320.	U-U0	11809.	11860.	11914.	11970.	12029.	12091.	12156.	12225.	12297.	12374.	12454.
	H-H0	18006.	18311.	18673.	19032.	19409.	19806.	20233.	20662.	21124.	21611.	22124.
	(S-S0)/R	-0.8098	-0.9409	-1.0644	-1.1816	-1.2936	-1.4012	-1.5051	-1.6058	-1.7039	-1.7996	-1.8934
2340.	U-U0	11941.	11993.	12047.	12103.	12163.	12225.	12291.	12360.	12433.	12510.	12591.
	H-H0	18192.	18519.	18863.	19224.	19604.	20003.	20423.	20864.	21329.	21819.	22335.
	(S-S0)/R	-0.7813	-0.9123	-1.0357	-1.1528	-1.2647	-1.3722	-1.4759	-1.5766	-1.6745	-1.7701	-1.8638
2360.	U-U0	12074.	12126.	12180.	12237.	12297.	12360.	12426.	12496.	12570.	12647.	12728.
	H-H0	18378.	18708.	19054.	19417.	19799.	20201.	20623.	21067.	21535.	22027.	22546.
	(S-S0)/R	-0.7529	-0.8838	-1.0071	-1.1241	-1.2359	-1.3433	-1.4470	-1.5475	-1.6453	-1.7408	-1.8344
2380.	U-U0	12207.	12259.	12314.	12371.	12432.	12495.	12562.	12632.	12706.	12784.	12866.
	H-H0	18565.	18896.	19244.	19610.	19994.	20398.	20823.	21270.	21740.	22235.	22757.
	(S-S0)/R	-0.7247	-0.8555	-0.9787	-1.0956	-1.2073	-1.3146	-1.4182	-1.5186	-1.6163	-1.7117	-1.8051
2400.	U-U0	12340.	12392.	12448.	12505.	12566.	12630.	12698.	12768.	12843.	12921.	13004.
	H-H0	18751.	19055.	19435.	19803.	20190.	20596.	21024.	21473.	21946.	22444.	22968.
	(S-S0)/R	-0.6966	-0.8274	-0.9505	-1.0674	-1.1789	-1.2861	-1.3896	-1.4899	-1.5875	-1.6828	-1.7761
2420.	U-U0	12473.	12526.	12582.	12640.	12701.	12766.	12834.	12905.	12980.	13059.	13142.
	H-H0	18938.	19274.	19627.	19997.	20386.	20794.	21224.	21676.	22152.	22653.	23180.
	(S-S0)/R	-0.6688	-0.7995	-0.9225	-1.0392	-1.1507	-1.2578	-1.3612	-1.4614	-1.5589	-1.6541	-1.7473
2440.	U-U0	12607.	12660.	12716.	12775.	12837.	12902.	12970.	13042.	13117.	13197.	13280.
	H-H0	19125.	19463.	19818.	20190.	20592.	20993.	21425.	21880.	22358.	22861.	23392.
	(S-S0)/R	-0.6411	-0.7717	-0.8947	-1.0113	-1.1227	-1.2297	-1.3330	-1.4331	-1.5305	-1.6255	-1.7186
2460.	U-U0	12741.	12794.	12851.	12910.	12972.	13038.	13106.	13179.	13255.	13335.	13419.
	H-H0	19313.	19653.	20010.	20384.	20778.	21191.	21626.	22083.	22564.	23070.	23603.
	(S-S0)/R	-0.6136	-0.7441	-0.8670	-0.9836	-1.0949	-1.2018	-1.3049	-1.4049	-1.5022	-1.5972	-1.6901
2480.	U-U0	12875.	12929.	12986.	13045.	13108.	13174.	13243.	13316.	13392.	13473.	13558.
	H-H0	19501.	19843.	20201.	20578.	20974.	21390.	21827.	22287.	22771.	23279.	23815.
	(S-S0)/R	-0.5863	-0.7167	-0.8395	-0.9560	-1.0672	-1.1740	-1.2771	-1.3770	-1.4741	-1.5690	-1.6618
2500.	U-U0	13009.	13063.	13121.	13181.	13244.	13310.	13380.	13453.	13530.	13611.	13697.
	H-H0	19688.	20032.	20394.	20773.	21171.	21589.	22029.	22491.	22977.	23489.	24027.
	(S-S0)/R	-0.5592	-0.6895	-0.8122	-0.9286	-1.0397	-1.1464	-1.2494	-1.3492	-1.4462	-1.5410	-1.6337
2520.	U-U0	13143.	13198.	13256.	13317.	13380.	13447.	13517.	13591.	13668.	13750.	13836.
	H-H0	19876.	20223.	20586.	20967.	21367.	21788.	22230.	22695.	23184.	23698.	24240.
	(S-S0)/R	-0.5322	-0.6624	-0.7850	-0.9013	-1.0124	-1.1190	-1.2219	-1.3216	-1.4185	-1.5132	-1.6058
2540.	U-U0	13278.	13334.	13392.	13453.	13517.	13584.	13654.	13729.	13807.	13889.	13976.
	H-H0	20065.	20413.	20778.	21162.	21564.	21987.	22432.	22899.	23391.	23908.	24452.
	(S-S0)/R	-0.5053	-0.6355	-0.7581	-0.8743	-0.9852	-1.0918	-1.1945	-1.2941	-1.3910	-1.4855	-1.5780
2560.	U-U0	13413.	13469.	13527.	13589.	13653.	13721.	13792.	13867.	13946.	14028.	14115.
	H-H0	20253.	20603.	20971.	21357.	21761.	22187.	22634.	23104.	23598.	24117.	24664.
	(S-S0)/R	-0.4787	-0.6088	-0.7312	-0.8474	-0.9582	-1.0647	-1.1674	-1.2669	-1.3636	-1.4580	-1.5504

(Table continues)

Table 3 (Continued)

RELATIVE INTERNAL ENERGY AND ENTHALPY (CALORIES/GM-MOLE) AND RELATIVE ENTROPY

TEMPERATURE (DEGREE K)	DENSITY (AMAGAT)											
	1050.	1100.	1150.	1200.	1250.	1300.	1350.	1400.	1450.	1500.	1550.	
2060. U-U0 10772.	10853.	10939.	11029.	11125.	11226.	11323.	11427.	11527.	11629.	11727.	11836.	11927.
H-H0 -19897.	20426.	20984.	21575.	22199.	22860.	23560.	24302.	25088.	25922.	26807.		
(S-S0)/R -2.3920	-2.4846	-2.5761	-2.6667	-2.7566	-2.8458	-2.9346	-3.0231	-3.1114	-3.1996	-3.2878		
2080. U-U0 10906.	10988.	11074.	11165.	11262.	11364.	11472.	11586.	11707.	11836.	11927.		
H-H0 20109.	20641.	21203.	21797.	22425.	23090.	23794.	24540.	25330.	26168.	27058.		
(S-S0)/R -2.3593	-2.4518	-2.5432	-2.6336	-2.7232	-2.8123	-2.9009	-2.9892	-3.0773	-3.1653	-3.2532		
2100. U-U0 11041.	11123.	11210.	11302.	11399.	11502.	11611.	11726.	11848.	11977.	12115.		
H-H0 20321.	20856.	21422.	22019.	22651.	23320.	24028.	24777.	25572.	26414.	27308.		
(S-S0)/R -2.3269	-2.4193	-2.5104	-2.6007	-2.6902	-2.7791	-2.8675	-2.9556	-3.0434	-3.1312	-3.2189		
2120. U-U0 11176.	11259.	11346.	11439.	11537.	11640.	11750.	11866.	11989.	12119.	12257.		
H-H0 20534.	21072.	21641.	22242.	22877.	23550.	24261.	25015.	25814.	26660.	27559.		
(S-S0)/R -2.2948	-2.3869	-2.4780	-2.5680	-2.6574	-2.7461	-2.8343	-2.9222	-3.0098	-3.0974	-3.1849		
2140. U-U0 11311.	11394.	11483.	11576.	11674.	11779.	11889.	12006.	12130.	12261.	12400.		
H-H0 20746.	21288.	21860.	22464.	23103.	23779.	24495.	25253.	26055.	26907.	27809.		
(S-S0)/R -2.2629	-2.3549	-2.4457	-2.5356	-2.6248	-2.7133	-2.8014	-2.8890	-2.9765	-3.0638	-3.1511		
2160. U-U0 11446.	11530.	11619.	11713.	11812.	11917.	12029.	12146.	12271.	12404.	12543.		
H-H0 20959.	21093.	22079.	22687.	23330.	24009.	24729.	25490.	26297.	27153.	28060.		
(S-S0)/R -2.2312	-2.3230	-2.4137	-2.5035	-2.5924	-2.6808	-2.7687	-2.8562	-2.9434	-3.0305	-3.1176		
2180. U-U0 11582.	11667.	11756.	11851.	11951.	12057.	12159.	12287.	12413.	12546.	12687.		
H-H0 21171.	21719.	22298.	22910.	23556.	24239.	24902.	25728.	26539.	27399.	28310.		
(S-S0)/R -2.1997	-2.2914	-2.3820	-2.4715	-2.5603	-2.6485	-2.7362	-2.8235	-2.9106	-2.9975	-3.0844		
2200. U-U0 11718.	11803.	11893.	11989.	12089.	12196.	12309.	12428.	12554.	12688.	12830.		
H-H0 21384.	21936.	22518.	23132.	23782.	24469.	25196.	25966.	26781.	27645.	28561.		
(S-S0)/R -2.1685	-2.2600	-2.3504	-2.4398	-2.5285	-2.6165	-2.7040	-2.7911	-2.8780	-2.9647	-3.0514		
2220. U-U0 11854.	11940.	12031.	12127.	12228.	12336.	12449.	12569.	12696.	12831.	12974.		
H-H0 21597.	22152.	2237.	23355.	24009.	24700.	25430.	26204.	27023.	27891.	28811.		
(S-S0)/R -2.1374	-2.2289	-2.3191	-2.4084	-2.4969	-2.5847	-2.6720	-2.7589	-2.8456	-2.9341	-3.0186		
2240. U-U0 11990.	12077.	12169.	12265.	12367.	12475.	12590.	12711.	12839.	12974.	13118.		
H-H0 21810.	22368.	23097.	23578.	24235.	24930.	25604.	26442.	27265.	28117.	29062.		
(S-S0)/R -2.1066	-2.1979	-2.2880	-2.3771	-2.4654	-2.5531	-2.6403	-2.7270	-2.8135	-2.8988	-2.9861		
2260. U-U0 12127.	12214.	12307.	12404.	12507.	12616.	12731.	12852.	12981.	13118.	13262.		
H-H0 22024.	22985.	23177.	23802.	24462.	25160.	25898.	26680.	27507.	28385.	29312.		
(S-S0)/R -2.0761	-2.1672	-2.2571	-2.3461	-2.4343	-2.5218	-2.6082	-2.6953	-2.7816	-2.8677	-2.9538		
2280. U-U0 12264.	12352.	12445.	12543.	12646.	12756.	12872.	12994.	13124.	13261.	13407.		
H-H0 22237.	22801.	23396.	24025.	24689.	25390.	26132.	26918.	27749.	28629.	29562.		
(S-S0)/R -2.0457	-2.1367	-2.2265	-2.3153	-2.4033	-2.4906	-2.5774	-2.6638	-2.7500	-2.8359	-2.9217		
2300. U-U0 12401.	12490.	12583.	12682.	12786.	12897.	13013.	13136.	13267.	13405.	13552.		
H-H0 22451.	23018.	23616.	24248.	24916.	25621.	26307.	27156.	27991.	28875.	29813.		
(S-S0)/R -2.0155	-2.1064	-2.1960	-2.2847	-2.3725	-2.4597	-2.5464	-2.6326	-2.7185	-2.8043	-2.8889		
2320. U-U0 12539.	12628.	12722.	12821.	12926.	13037.	13155.	13279.	13410.	13549.	13697.		
H-H0 22665.	23235.	23837.	24472.	25142.	25851.	26601.	27394.	28233.	29121.	30063.		
(S-S0)/R -1.9856	-2.0763	-2.1658	-2.2543	-2.3420	-2.4290	-2.5155	-2.6016	-2.6873	-2.7729	-2.8583		
2340. U-U0 12676.	12766.	12861.	12961.	13067.	13178.	13297.	13421.	13554.	13694.	13842.		
H-H0 22879.	23492.	24057.	24695.	25369.	26082.	26835.	27532.	28475.	29367.	30133.		
(S-S0)/R -1.9558	-2.0464	-2.1358	-2.2241	-2.3117	-2.3985	-2.4849	-2.5707	-2.6563	-2.7417	-2.8270		
2360. U-U0 12814.	12905.	13000.	13101.	13207.	13320.	13439.	13564.	13697.	13838.	13987.		
H-H0 23093.	23669.	24277.	24919.	25597.	26261.	26930.	27670.	28317.	29013.	30563.		
(S-S0)/R -1.9263	-2.0167	-2.1059	-2.1942	-2.2816	-2.3683	-2.4544	-2.5401	-2.6256	-2.7108	-2.7958		
2380. U-U0 12952.	13044.	13140.	13241.	13348.	13461.	13581.	13707.	13841.	13983.	14133.		
H-H0 23307.	23886.	24498.	25143.	25824.	26531.	27234.	27914.	28698.	29459.	30184.		
(S-S0)/R -1.8969	-1.9872	-2.0763	-2.1644	-2.2517	-2.3382	-2.4242	-2.5098	-2.5950	-2.6800	-2.7649		
2400. U-U0 13091.	13183.	13279.	13381.	13489.	13603.	13723.	13851.	13985.	14128.	14279.		
H-H0 23521.	24104.	24718.	25367.	26051.	26747.	27538.	28346.	29201.	30106.	31064.		
(S-S0)/R -1.8677	-1.9579	-2.0469	-2.1352	-2.2219	-2.3083	-2.3942	-2.4796	-2.5646	-2.6495	-2.7342		
2420. U-U0 13230.	13322.	13419.	13522.	13631.	13745.	13866.	13994.	14130.	14273.	14425.		
H-H0 23736.	24321.	24939.	25590.	26278.	27005.	27773.	28584.	29443.	30352.	31314.		
(S-S0)/R -1.8388	-1.9288	-2.0177	-2.1055	-2.1924	-2.2787	-2.3644	-2.4496	-2.5345	-2.6192	-2.7037		
2440. U-U0 13369.	13461.	13559.	13663.	13772.	13887.	14009.	14138.	14274.	14418.	14571.		
H-H0 23950.	24539.	25160.	25815.	26506.	27236.	28007.	28823.	29685.	30598.	31564.		
(S-S0)/R -1.8100	-1.8989	-1.9886	-2.0763	-2.1631	-2.2492	-2.3347	-2.4198	-2.5046	-2.5891	-2.6734		
2460. U-U0 13508.	13601.	13700.	13804.	13914.	14030.	14152.	14282.	14419.	14564.	14717.		
H-H0 24165.	24757.	25381.	26039.	26733.	27467.	28242.	29061.	29927.	30844.	31814.		
(S-S0)/R -1.7814	-1.8712	-1.9598	-2.0473	-2.1340	-2.2199	-2.3053	-2.3902	-2.4748	-2.5592	-2.6433		
2480. U-U0 13647.	13741.	13841.	13945.	14056.	14172.	14296.	14426.	14564.	14709.	14864.		
H-H0 24380.	24974.	25602.	26263.	26961.	27698.	28476.	29299.	30169.	31090.	32064.		
(S-S0)/R -1.7530	-1.8427	-1.9311	-2.0185	-2.1050	-2.1909	-2.2761	-2.3609	-2.4453	-2.5294	-2.6135		
2500. U-U0 13787.	13881.	13981.	14087.	14198.	14315.	14439.	14570.	14709.	14855.	15011.		
H-H0 24595.	25192.	25823.	26487.	27189.	27929.	28711.	29538.	30411.	31336.	32314.		
(S-S0)/R -1.7247	-1.8143	-1.9026	-1.9899	-2.0763	-2.1620	-2.2471	-2.3317	-2.4159	-2.4999	-2.5838		
2520. U-U0 13927.	14022.	14122.	14228.	14340.	14458.	14583.	14715.	14854.	15002.	15158.		
H-H0 24810.	25411.	26044.	26712.	27416.	28160.	28946.	29776.	30654.	31582.	32565.		
(S-S0)/R -1.6967	-1.7861	-1.8743	-1.9615	-2.0477	-2.1333	-2.2182	-2.3027	-2.3868	-2.4706	-2.5543		
2540. U-U0 14067.	14163.	14264.	14370.	14483.	14602.	14727.	14860.	15000.	15148.	15305.		
H-H0 25025.	25629.	26265.	26936.	27644.	28391.	29181.	30014.	30896.	31825.	32815.		
(S-S0)/R -1.6688	-1.7581	-1.8462	-1.9332	-2.0194	-2.1048	-2.1895	-2.2739	-2.3578	-2.4415	-2.5250		
2560. U-U0 14207.	14304.	14405.	14513.	14626.	14745.	14871.	15005.	15146.	15295.	15452.		
H-H0 25240.	25847.	26487.	27161.	27872.	28623.	29415.	30253.	31138.	32074.	33065.		
(S-S0)/R -1.6411	-1.7303	-1.8183	-1.9052	-1.9912	-2.0764	-2.1611	-2.2452	-2.3290	-2.4126	-2.4959		

(Table continues)

Table 3 (Continued)

RELATIVE INTERNAL ENERGY AND ENTHALPY (CALORIES/GM-MOLE) AND RELATIVE ENTROPY

TEMPERATURE (DEGREE K.)	DENSITY (AMAGAT)									
	1600.	1650.	1700.	1750.	1800.	1850.	1900.	1950.	2000.	
2060. U-UO	11974.	12127.	12290.	12463.	12647.	12844.	13054.	13277.	13516.	
	H-HO	27747.	28746.	29809.	30940.	32144.	33428.	34797.	36258.	37819.
	(S-S0)/R	-3.3761	-3.4645	-3.5532	-3.6422	-3.7315	-3.8212	-3.9114	-4.0021	-4.0932
2080. U-UO	12117.	12271.	12435.	12609.	12795.	12993.	13204.	13429.	13669.	
	H-HO	28002.	29068.	30074.	31210.	32419.	33708.	35083.	36550.	38117.
	(S-S0)/R	-3.3413	-3.4295	-3.5179	-3.6066	-3.6956	-3.7851	-3.8749	-3.9653	-4.0561
2100. U-UO	12261.	12416.	12581.	12756.	12943.	13142.	13354.	13580.	13822.	
	H-HO	28258.	29266.	30339.	31480.	32694.	33989.	35369.	36841.	38414.
	(S-S0)/R	-3.3067	-3.3947	-3.4828	-3.5713	-3.6601	-3.7492	-3.8388	-3.9288	-4.0193
2120. U-UO	12404.	12560.	12726.	12903.	13090.	13291.	13504.	13732.	13975.	
	H-HO	28513.	29526.	30603.	31749.	32969.	34269.	35654.	37132.	38711.
	(S-S0)/R	-3.2725	-3.3602	-3.4481	-3.5363	-3.6248	-3.7136	-3.8029	-3.8927	-3.9829
2140. U-UO	12548.	12705.	12872.	13050.	13239.	13440.	13654.	13883.	14128.	
	H-HO	28768.	29786.	30868.	32019.	33244.	34549.	35940.	37423.	39007.
	(S-S0)/R	-3.2385	-3.3259	-3.4136	-3.5015	-3.5898	-3.6784	-3.7674	-3.8568	-3.9467
2160. U-UO	12692.	12850.	13018.	13197.	13387.	13589.	13805.	14035.	14281.	
	H-HO	29023.	30046.	31133.	32289.	33519.	34829.	36225.	37714.	39303.
	(S-S0)/R	-3.2047	-3.2920	-3.3794	-3.4671	-3.5550	-3.6434	-3.7321	-3.8212	-3.9108
2180. U-UO	12837.	12996.	13165.	13344.	13535.	13739.	13956.	14187.	14434.	
	H-HO	29278.	30305.	31397.	32598.	33793.	35108.	36510.	38004.	39599.
	(S-S0)/R	-3.1713	-3.2583	-3.4354	-3.5206	-3.6086	-3.6971	-3.7859	-3.8752	
2200. U-UO	12981.	13141.	13311.	13492.	13684.	13889.	14107.	14340.	14588.	
	H-HO	29533.	30565.	31661.	32827.	34067.	35388.	36794.	38294.	39895.
	(S-S0)/R	-3.1380	-3.2248	-3.3118	-3.3989	-3.4864	-3.5742	-3.6624	-3.7509	-3.8399
2220. U-UO	13126.	13287.	13458.	13640.	13833.	14039.	14258.	14492.	14741.	
	H-HO	29780.	30824.	31925.	33096.	34341.	35667.	37079.	38584.	40190.
	(S-S0)/R	-3.1051	-3.1916	-3.2783	-3.3653	-3.4525	-3.5400	-3.6279	-3.7162	-3.8049
2240. U-UO	13271.	13433.	13605.	13788.	13982.	14189.	14410.	14645.	14895.	
	H-HO	30043.	31084.	32190.	33365.	34615.	35946.	37363.	38674.	40485.
	(S-S0)/R	-3.0723	-3.1587	-3.2451	-3.3319	-3.4188	-3.5061	-3.5937	-3.6818	-3.7702
2260. U-UO	13416.	13579.	13752.	13936.	14131.	14340.	14561.	14797.	15049.	
	H-HO	30297.	31343.	32454.	33634.	34889.	36225.	37647.	39163.	40780.
	(S-S0)/R	-3.0398	-3.1260	-3.2122	-3.2987	-3.3854	-3.4724	-3.5598	-3.6476	-3.7357
2280. U-UO	13561.	13725.	13899.	14084.	14281.	14490.	14713.	14950.	15203.	
	H-HO	30592.	31602.	32717.	33902.	35162.	36503.	37931.	39452.	41074.
	(S-S0)/R	-3.0076	-3.0935	-3.1795	-3.2658	-3.3523	-3.4390	-3.5262	-3.6137	-3.7015
2300. U-UO	13707.	13872.	14047.	14233.	14431.	14641.	14865.	15103.	15358.	
	H-HO	30807.	31861.	32981.	34171.	35436.	36782.	38214.	39741.	41368.
	(S-S0)/R	-2.9756	-3.0613	-3.1471	-3.2331	-3.3194	-3.4059	-3.4928	-3.5800	-3.6676
2320. U-UO	13853.	14019.	14195.	14382.	14581.	14792.	15017.	15257.	15512.	
	H-HO	31061.	32120.	33245.	34439.	35709.	37060.	38498.	40029.	41662.
	(S-S0)/R	-2.9438	-3.0293	-3.1149	-3.2007	-3.2867	-3.3730	-3.4596	-3.5466	-3.6339
2340. U-UO	13999.	14166.	14343.	14531.	14731.	14943.	15169.	15410.	15667.	
	H-HO	31316.	32379.	33508.	34708.	35982.	37338.	38781.	40317.	41955.
	(S-S0)/R	-2.9122	-2.9975	-3.0829	-3.1685	-3.2543	-3.3403	-3.4267	-3.5134	-3.6005
2360. U-UO	14145.	14313.	14491.	14680.	14881.	15094.	15322.	15564.	15822.	
	H-HO	31570.	32638.	33772.	34976.	36255.	37616.	39064.	40605.	42249.
	(S-S0)/R	-2.8809	-2.9660	-3.0512	-3.1365	-3.2221	-3.3079	-3.3941	-3.4805	-3.5673
2380. U-UO	14292.	14460.	14639.	14829.	15031.	15246.	15474.	15718.	15977.	
	H-HO	31825.	32897.	34035.	35244.	36528.	37893.	39346.	40893.	42542.
	(S-S0)/R	-2.8498	-2.9347	-3.0196	-3.1048	-3.1901	-3.2757	-3.3616	-3.4479	-3.5344
2400. U-UO	14438.	14608.	14788.	14979.	15182.	15398.	15627.	15872.	16132.	
	H-HO	32079.	33156.	34299.	35512.	36801.	38171.	39629.	41181.	42835.
	(S-S0)/R	-2.8189	-2.9036	-2.9883	-3.0733	-3.1584	-3.2438	-3.3294	-3.4154	-3.5017
2420. U-UO	14585.	14756.	14937.	15129.	15333.	15549.	15780.	16026.	16287.	
	H-HO	32334.	33415.	34262.	35780.	37073.	38448.	39911.	41468.	43127.
	(S-S0)/R	-2.7882	-2.8727	-2.9573	-3.0420	-3.1269	-3.2121	-3.2975	-3.3832	-3.4693
2440. U-UO	14732.	14904.	15086.	15279.	15484.	15702.	15933.	16180.	16443.	
	H-HO	32588.	33674.	34825.	36047.	37348.	38726.	40193.	41755.	43419.
	(S-S0)/R	-2.7577	-2.8420	-2.9264	-3.0109	-3.0956	-3.1806	-3.2658	-3.3513	-3.4371
2460. U-UO	14880.	15052.	15235.	15429.	15635.	15854.	16087.	16334.	16598.	
	H-HO	32842.	33932.	35088.	36315.	37618.	39003.	40475.	42042.	43711.
	(S-S0)/R	-2.7275	-2.8116	-2.8958	-2.9801	-3.0646	-3.1493	-3.2343	-3.3195	-3.4051
2480. U-UO	15027.	15200.	15384.	15579.	15786.	16006.	16240.	16489.	16754.	
	H-HO	33097.	34191.	35351.	36583.	37890.	39280.	40757.	42329.	44003.
	(S-S0)/R	-2.6974	-2.7813	-2.8653	-2.9494	-3.0337	-3.1182	-3.2030	-3.2880	-3.3734
2500. U-UO	15175.	15349.	15534.	15730.	15938.	16159.	16394.	16644.	16910.	
	H-HO	33351.	34449.	35614.	36850.	38162.	39556.	41039.	42616.	44295.
	(S-S0)/R	-2.6675	-2.7513	-2.8351	-2.9190	-3.0031	-3.0874	-3.1719	-3.2568	-3.3419
2520. U-UO	15323.	15498.	15683.	15880.	16089.	16311.	16547.	16799.	17066.	
	H-HO	33605.	34708.	35877.	37117.	38434.	39833.	41320.	42902.	44586.
	(S-S0)/R	-2.6379	-2.7214	-2.8051	-2.8888	-2.9727	-3.0568	-3.1411	-3.2257	-3.3106
2540. U-UO	15471.	15647.	15833.	16031.	16241.	16464.	16701.	16954.	17222.	
	H-HO	33859.	34966.	36140.	37385.	38706.	40110.	41601.	43188.	44877.
	(S-S0)/R	-2.6084	-2.6918	-2.7752	-2.8588	-2.9425	-3.0263	-3.1105	-3.1948	-3.2795
2560. U-UO	15619.	15796.	15983.	16182.	16393.	16617.	16855.	17109.	17378.	
	H-HO	34113.	35225.	36402.	37652.	38978.	40386.	41883.	43474.	45168.
	(S-S0)/R	-2.5791	-2.6624	-2.7456	-2.8290	-2.9124	-2.9961	-3.0800	-3.1642	-3.2487

(Table continues)

Table 3 (Continued)

RELATIVE INTERNAL ENERGY AND ENTHALPY (CALORIES/GM-MOLE) AND RELATIVE ENTROPY

TEMPERATURE (DEGREE K)	DENSITY (AMAGAT)											
	1.	10.	50.	100.	150.	200.	250.	300.	350.	400.	450.	
2580. U-U0 H-H0 (S-S0)/R	13111. 17697. 6.0771	13117. 17736. 3.7693	13146. 17914. 2.1365	13183. 18147. 1.4138	13222. 18390. 0.9782	13262. 18644. 0.6599	13304. 18910. 0.4055	13349. 19188. 0.1914	13395. 19480. 0.0050	13444. 19786. -0.1615	13495. 20106. -0.3127	
	13243. 17869. 6.1028	13250. 17908. 3.7950	13278. 18088. 2.1623	13316. 18322. 1.4396	13355. 18566. 1.0041	13395. 18822. 0.6858	13438. 19089. 0.4315	13483. 19370. 0.2175	13530. 19663. 0.0311	13579. 19971. -0.1553	13630. 20293. -0.2865	
	13376. 18041. 6.1284	13382. 18081. 3.8206	13411. 18262. 2.1879	13449. 18497. 1.4653	13488. 18743. 1.0298	13529. 19000. 0.7116	13572. 19269. 0.4574	13617. 19551. 0.2434	13664. 19847. 0.0571	13714. 20156. -0.1992	13766. 20480. -0.2604	
2640. U-U0 H-H0 (S-S0)/R	13509. 18214. 6.1538	13515. 18254. 3.8460	13544. 18435. 2.2134	13582. 18672. 1.4908	13622. 18920. 1.0554	13663. 19179. 0.7372	13706. 19450. 0.4830	13752. 19733. 0.2692	13799. 19915. 0.0829	13849. 20134. -0.0833	13901. 20467. -0.2344	
	13642. 18386. 6.1790	13648. 18427. 3.8713	13677. 18610. 2.2387	13716. 18848. 1.5162	13755. 19097. 1.0808	13797. 19357. 0.7627	13886. 19630. 0.5086	13934. 19915. 0.2948	13984. 20214. 0.1086	14037. 20576. -0.0576	14087. 20855. -0.2086	
	13775. 18559. 6.2042	13781. 18600. 3.8964	13849. 18784. 2.2639	13889. 19024. 1.5414	13931. 19274. 1.1061	13975. 19536. 0.7880	14021. 19810. 0.5340	14070. 20098. 0.3202	14120. 20398. 0.1341	14173. 20713. -0.0320	14256. 21043. -0.1829	
2700. U-U0 H-H0 (S-S0)/R	15908. 18732. 6.2291	15915. 18773. 3.9214	15945. 18959. 2.2889	15983. 19200. 1.5665	16024. 19452. 1.1312	16066. 19715. 0.8132	16110. 19991. 0.5592	16157. 20280. 0.3455	16205. 20582. 0.1594	16256. 20899. -0.0666	16309. 21231. -0.1574	
	14042. 18906. 6.2940	14049. 18947. 3.9462	14079. 19133. 2.3138	14118. 19376. 1.5914	14158. 19630. 1.1562	14201. 19895. 0.8382	14245. 20172. 0.5843	14292. 20463. 0.3707	14341. 20767. 0.1847	14392. 21089. -0.0187	14446. 21419. -0.1321	
	14176. 19080. 6.2787	14183. 19121. 3.9709	14213. 19308. 2.3385	14252. 19522. 1.6162	14293. 19808. 1.1810	14336. 20074. 0.8631	14381. 20354. 0.6093	14428. 20646. 0.3957	14477. 20951. 0.2097	14528. 21272. 0.0458	14582. 21607. -0.1069	
2760. U-U0 H-H0 (S-S0)/R	14310. 19253. 6.3032	14317. 19295. 3.9955	14347. 19484. 2.3631	14387. 19729. 1.6408	14428. 19986. 1.2057	14471. 20254. 0.8879	14516. 20535. 0.6341	14564. 20829. 0.4266	14613. 21136. 0.2347	14665. 21458. 0.0688	14719. 21796. -0.0818	
	14444. 19428. 6.3276	14451. 19469. 4.0199	14482. 19659. 2.3876	14521. 19846. 1.6653	14563. 20164. 1.2303	14607. 20434. 0.9125	14652. 20717. 0.6588	14700. 21012. 0.4453	14750. 21321. 0.2595	14802. 21645. 0.0937	14856. 21984. -0.0569	
	14579. 19602. 6.3519	14586. 19644. 4.0442	14617. 19835. 2.4119	14657. 20083. 1.6897	14698. 20343. 1.2547	14742. 20614. 0.9370	14788. 20898. 0.6833	14836. 21196. 0.4699	14886. 21507. 0.2841	14939. 21852. 0.1184	14994. 22173. -0.0321	
2820. U-U0 H-H0 (S-S0)/R	14714. 19776. 6.3760	14721. 19819. 4.0684	14752. 20011. 2.4361	14799. 20261. 1.7140	14834. 20522. 1.2790	14878. 20795. 0.9613	14924. 21077. 0.7077	14973. 21379. 0.4944	15023. 21692. 0.3086	15076. 22019. 0.1430	15131. 22362. -0.0075	
	14849. 19951. 6.4001	14856. 19994. 4.0924	14887. 20187. 2.4601	14927. 20438. 1.7381	14970. 20795. 1.3032	15014. 21055. 0.9856	15061. 21263. 0.7320	15109. 21563. 0.5187	15160. 21878. 0.3330	15213. 22207. 0.1674	15269. 22552. 0.0170	
	14984. 20126. 6.4239	14991. 20169. 4.1165	15022. 20363. 2.4841	15063. 20616. 1.7620	15106. 20880. 1.3272	15151. 21156. 1.0096	15197. 21445. 0.7561	15246. 21747. 0.5429	15297. 22064. 0.3573	15351. 22394. 0.1917	15407. 22741. 0.0414	
2880. U-U0 H-H0 (S-S0)/R	15119. 20301. 6.4477	15126. 20344. 4.1400	15158. 20540. 2.5079	15199. 20794. 1.7859	15242. 21060. 1.3511	15287. 21337. 1.0336	15334. 21628. 0.7801	15383. 21932. 0.5669	15435. 22250. 0.3614	15489. 22582. 0.2159	15545. 22931. 0.0656	
	15255. 20476. 6.4713	15262. 20520. 4.1637	15294. 20716. 2.5319	15335. 20972. 1.8096	15379. 21239. 1.3749	15424. 21519. 1.0574	15471. 21811. 0.8040	15521. 22116. 0.5909	15573. 22436. 0.4054	15627. 22770. 0.2400	15684. 23120. 0.0897	
	15391. 20652. 6.4948	15398. 20696. 4.1872	15430. 20893. 2.5551	15472. 21150. 1.8332	15515. 21419. 1.3985	15561. 21700. 1.0811	15608. 21944. 0.8277	15658. 22301. 0.6146	15710. 22622. 0.4292	15765. 22958. 0.2639	15822. 23310. 0.1137	
2940. U-U0 H-H0 (S-S0)/R	15527. 20828. 6.5182	15534. 20872. 4.2105	15566. 21070. 2.5785	15608. 21239. 1.8566	15652. 21599. 1.4220	15698. 21882. 1.1046	15746. 22177. 0.8513	15796. 22486. 0.6383	15849. 22809. 0.4529	15903. 23147. 0.2877	15961. 23501. 0.1376	
	15663. 21004. 6.5414	15670. 21048. 4.2338	15703. 21248. 2.6018	15745. 21508. 1.8800	15789. 21779. 1.4454	15835. 22063. 1.1281	15883. 22360. 0.8748	15934. 22671. 0.6619	15987. 22995. 0.4765	16042. 23335. 0.3113	16100. 23691. 0.1613	
	15799. 21180. 6.5645	15806. 21224. 4.2969	15839. 21245. 2.6249	15882. 21687. 1.9032	15926. 21960. 1.4686	15973. 22245. 1.1514	16021. 22544. 0.8982	16072. 22856. 0.6853	16125. 23182. 0.5000	16181. 23554. 0.3348	16239. 23881. 0.1849	
3000. U-U0 H-H0 (S-S0)/R	15936. 21356. 6.5875	15943. 21401. 4.2799	15976. 21403. 2.6480	16019. 21866. 1.9263	16064. 22141. 1.4918	16110. 22428. 1.1746	16159. 22728. 0.9214	16210. 23041. 0.7086	16264. 23369. 0.5234	16320. 23713. 0.3582	16378. 24072. 0.2083	
	15936. 21356. 6.5875	15943. 21401. 4.2799	15976. 21403. 2.6480	16019. 21866. 1.9263	16064. 22141. 1.4918	16110. 22428. 1.1746	16159. 22728. 0.9214	16210. 23041. 0.7086	16264. 23369. 0.5234	16320. 23713. 0.3582	16378. 24072. 0.2083	

(Table continues)

Table 3 (Continued)

RELATIVE INTERNAL ENERGY AND ENTHALPY (CALORIES/GM-MOLE) AND RELATIVE ENTROPY

TEMPERATURE (DEGREE K)	DENSITY (AMAGAT)										
	500.	550.	600.	650.	700.	750.	800.	850.	900.	950.	1000.
2580. U-U0 13549. 13605. 13664. 13725. 13790. 13858. 13930. 14005. 14084. 14168. 14255. H-H0 20442. 20794. 21164. 21552. 21959. 22366. 22836. 23308. 23805. 24327. 24877. (S-S0)/R -0.4522 -0.5822 -0.7046 -0.8206 -0.9314 -1.0378 -1.1404 -1.2398 -1.3364 -1.4307 -1.5230											
2600. U-U0 13684. 13741. 13800. 13862. 13927. 13996. 14065. 14144. 14223. 14307. 14395. H-H0 20631. 20985. 21357. 21747. 22156. 22566. 23038. 23513. 24012. 24537. 25090. (S-S0)/R -0.4258 -0.5558 -0.6781 -0.7941 -0.9048 -1.0110 -1.1135 -1.2128 -1.3094 -1.4036 -1.4958											
2620. U-U0 13820. 13877. 13936. 13999. 14065. 14134. 14206. 14283. 14363. 14447. 14536. H-H0 20820. 21176. 21550. 21942. 22354. 22786. 23240. 23718. 24219. 24747. 25303. (S-S0)/R -0.3997 -0.5295 -0.6518 -0.7676 -0.8783 -0.9844 -1.0868 -1.1860 -1.2825 -1.3766 -1.4687											
2640. U-U0 13956. 14013. 14073. 14136. 14202. 14272. 14345. 14422. 14502. 14587. 14676. H-H0 21009. 21367. 21743. 22138. 22552. 22986. 23443. 23923. 24427. 24958. 25516. (S-S0)/R -0.3736 -0.5034 -0.6256 -0.7414 -0.8519 -0.9580 -1.0603 -1.1594 -1.2558 -1.3498 -1.4418											
2660. U-U0 14092. 14150. 14210. 14274. 14340. 14410. 14484. 14561. 14642. 14727. 14817. H-H0 21199. 21559. 21937. 22333. 22750. 23187. 23646. 24128. 24635. 25168. 25729. (S-S0)/R -0.3478 -0.4775 -0.5996 -0.7153 -0.8257 -0.9317 -1.0340 -1.1330 -1.2292 -1.3231 -1.4150											
2680. U-U0 14228. 14286. 14347. 14411. 14478. 14549. 14623. 14700. 14782. 14868. 14958. H-H0 21388. 21751. 22131. 22529. 22948. 23387. 23848. 24333. 24843. 25378. 25942. (S-S0)/R -0.3220 -0.4517 -0.5737 -0.6893 -0.7997 -0.9056 -1.0078 -1.1067 -1.2029 -1.2967 -1.3884											
2700. U-U0 14365. 14423. 14485. 14549. 14617. 14687. 14762. 14840. 14922. 15009. 15100. H-H0 21578. 21943. 22325. 22725. 23146. 23588. 24051. 24539. 25051. 25589. 26155. (S-S0)/R -0.2965 -0.4261 -0.5480 -0.6635 -0.7738 -0.8797 -1.0005 -1.1085 -1.1766 -1.2703 -1.3620											
2720. U-U0 14502. 14561. 14622. 14687. 14755. 14826. 14901. 14980. 15063. 15150. 15241. H-H0 21768. 22135. 22519. 22922. 23345. 23789. 24225. 24744. 25259. 25800. 26369. (S-S0)/R -0.2711 -0.4006 -0.5224 -0.6379 -0.7481 -0.8538 -0.9556 -1.0546 -1.1505 -1.2441 -1.3357											
2740. U-U0 14639. 14698. 14760. 14825. 14894. 14966. 15041. 15120. 15203. 15291. 15383. H-H0 21959. 22327. 22713. 23118. 23543. 23989. 24458. 24950. 25467. 26011. 26583. (S-S0)/R -0.2458 -0.3752 -0.4970 -0.6124 -0.7225 -0.8282 -0.9301 -1.0287 -1.1246 -1.2181 -1.3096											
2760. U-U0 14776. 14836. 14898. 14964. 15033. 15105. 15181. 15260. 15344. 15432. 15525. H-H0 22149. 22519. 22908. 23315. 23742. 24191. 24661. 25156. 25676. 26222. 26796. (S-S0)/R -0.2206 -0.3500 -0.4717 -0.5870 -0.6971 -0.8027 -0.9045 -1.0030 -1.0988 -1.1923 -1.2836											
2780. U-U0 14914. 14974. 15037. 15103. 15172. 15245. 15321. 15401. 15485. 15574. 15667. H-H0 22340. 22712. 23102. 23512. 23941. 24392. 24865. 25362. 25884. 26433. 27010. (S-S0)/R -0.1957 -0.3250 -0.4466 -0.5618 -0.6718 -0.7773 -0.8790 -0.9775 -1.0732 -1.1665 -1.2578											
2800. U-U0 15051. 15112. 15175. 15242. 15311. 15384. 15461. 15542. 15626. 15715. 15809. H-H0 22530. 22905. 23297. 23709. 24140. 24593. 25069. 25568. 26093. 26644. 27224. (S-S0)/R -0.1708 -0.3000 -0.4216 -0.5368 -0.6467 -0.7521 -0.8537 -0.9521 -1.0477 -1.1410 -1.2321											
2820. U-U0 15189. 15250. 15314. 15381. 15451. 15524. 15601. 15683. 15768. 15857. 15951. H-H0 22721. 23098. 23492. 23906. 24340. 24795. 25273. 25775. 26302. 26856. 27438. (S-S0)/R -0.1461 -0.2753 -0.3967 -0.5118 -0.6217 -0.7270 -0.8285 -0.9269 -1.0224 -1.1155 -1.2066											
2840. U-U0 15327. 15389. 15453. 15520. 15590. 15664. 15742. 15824. 15909. 15999. 16094. H-H0 22913. 23291. 23687. 24103. 24539. 24997. 25477. 25981. 26511. 27067. 27653. (S-S0)/R -0.1215 -0.2506 -0.3720 -0.4871 -0.5968 -0.7021 -0.8035 -0.9018 -0.9972 -1.0903 -1.1812											
2860. U-U0 15466. 15527. 15592. 15660. 15730. 15805. 15883. 15965. 16051. 16142. 16237. H-H0 23104. 23484. 23883. 24301. 24739. 25199. 25681. 26188. 26720. 27279. 27867. (S-S0)/R -0.0971 -0.2261 -0.3474 -0.4624 -0.5721 -0.6773 -0.7787 -0.8768 -0.9722 -1.0651 -1.1560											
2880. U-U0 15604. 15666. 15731. 15799. 15871. 15945. 16011. 16086. 16160. 16193. 16284. H-H0 23295. 23678. 24078. 24498. 24939. 25401. 25885. 26395. 26929. 27491. 28081. (S-S0)/R -0.0728 -0.2017 -0.3230 -0.4379 -0.5475 -0.6526 -0.7539 -0.8520 -0.9472 -1.0401 -1.1309											
2900. U-U0 15743. 15805. 15871. 15939. 16001. 16086. 16165. 16248. 16335. 16427. 16523. H-H0 23487. 23871. 24274. 24696. 25139. 25603. 26090. 26601. 27139. 27703. 28296. (S-S0)/R -0.0486 -0.1775 -0.2987 -0.4135 -0.5230 -0.6281 -0.7293 -0.8273 -0.9225 -1.0153 -1.1060											
2920. U-U0 15892. 15945. 16010. 16079. 16151. 16227. 16307. 16390. 16478. 16570. 16666. H-H0 23679. 24065. 24470. 24894. 25339. 25805. 26295. 26809. 27348. 27915. 28511. (S-S0)/R -0.0246 -0.1534 -0.2745 -0.3893 -0.4987 -0.6037 -0.7048 -0.8027 -0.8978 -0.9905 -1.0812											
2940. U-U0 16021. 16084. 16150. 16220. 16292. 16360. 16433. 16510. 16590. 16674. 16763. H-H0 23871. 24259. 24666. 25092. 25539. 26008. 26499. 27016. 27558. 28127. 28726. (S-S0)/R -0.0007 -0.1294 -0.2505 -0.3652 -0.4746 -0.5794 -0.6805 -0.7783 -0.8733 -0.9660 -1.0565											
2960. U-U0 16160. 16224. 16290. 16360. 16433. 16510. 16590. 16674. 16763. 16856. 16954. H-H0 24063. 24453. 24862. 25290. 25739. 26210. 26704. 27223. 27768. 28340. 28941. (S-S0)/R 0.0231 -0.1056 -0.2266 -0.3412 -0.4505 -0.5553 -0.6563 -0.7540 -0.8490 -0.9415 -1.0320											
2980. U-U0 16300. 16364. 16431. 16501. 16574. 16651. 16732. 16817. 16906. 16999. 17098. H-H0 24256. 24648. 25058. 25489. 25940. 26413. 26909. 27430. 27977. 28552. 29156. (S-S0)/R 0.0467 -0.0819 -0.2028 -0.3174 -0.4266 -0.5313 -0.6322 -0.7299 -0.8248 -0.9172 -1.0076											
3000. U-U0 16440. 16504. 16571. 16642. 16716. 16793. 16874. 16950. 17049. 17143. 17242. H-H0 24448. 24842. 25255. 25667. 26141. 26616. 27115. 27638. 28187. 28764. 29371. (S-S0)/R 0.0703 -0.0583 -0.1792 -0.2936 -0.4028 -0.5075 -0.6083 -0.7059 -0.8007 -0.8930 -0.9833											

(Table continues)

Table 3 (Continued)

RELATIVE INTERNAL ENERGY AND ENTHALPY (CALORIES/GM-MOLE) AND RELATIVE ENTROPY

TEMPERATURE (DEGREE K)	DENSITY (AMAGAT)											
	1050.	1100.	1150.	1200.	1250.	1300.	1350.	1400.	1450.	1500.	1550.	
2580. U-UO 14347. 14445. 14547. 14655. 14769. 14889. 15016. 15150. 15291. 15441. 15600.	H-HO 25456. 26066. 26708. 27386. 28100. 28854. 29650. 30491. 31380. 32320. 33315.	(S-S0)/R -1.6136 -1.7027 -1.7905 -1.8773 -1.9631 -2.0483 -2.1328 -2.2168 -2.3004 -2.3838 -2.4670										
2600. U-UO 14488. 14586. 14689. 14798. 14912. 15033. 15160. 15295. 15438. 15588. 15748.	H-HO 25671. 26284. 26930. 27510. 28328. 29086. 29885. 30730. 31622. 32546. 33565.	(S-S0)/R -1.5862 -1.6752 -1.7629 -1.8496 -1.9353 -2.0203 -2.1047 -2.1885 -2.2720 -2.3553 -2.4383										
2620. U-UO 14629. 14728. 14831. 14940. 15056. 15177. 15305. 15441. 15584. 15745. 15895.	H-HO 25887. 26503. 27152. 27835. 28556. 29317. 30120. 30968. 31865. 32812. 33815.	(S-S0)/R -1.5590 -1.6479 -1.7355 -1.8220 -1.9076 -1.9925 -2.0767 -2.1605 -2.2438 -2.3269 -2.4097										
2640. U-UO 14770. 14869. 14974. 15083. 15199. 15321. 15450. 15587. 15731. 15883. 16044.	H-HO 26103. 26722. 27373. 28060. 28785. 29549. 30355. 31207. 32107. 33058. 34065.	(S-S0)/R -1.5320 -1.6208 -1.7082 -1.7946 -1.8801 -1.9649 -2.0490 -2.1326 -2.2158 -2.2987 -2.3814										
2660. U-UO 14912. 15011. 15116. 15227. 15343. 15466. 15596. 15733. 15877. 16044. 16192.	H-HO 26319. 26941. 27595. 28285. 29013. 29780. 30590. 31446. 32349. 33355. 34315.	(S-S0)/R -1.5052 -1.5938 -1.6812 -1.7674 -1.8528 -1.9374 -2.0214 -2.1048 -2.1879 -2.2706 -2.3532										
2680. U-UO 15053. 15153. 15259. 15370. 15487. 15611. 15741. 15879. 16024. 16178. 16340.	H-HO 26539. 27160. 27817. 28511. 29241. 30012. 30826. 31684. 32592. 33551. 34565.	(S-S0)/R -1.4785 -1.5670 -1.6542 -1.7404 -1.8256 -1.9101 -1.9939 -2.0773 -2.1602 -2.2428 -2.3252										
2700. U-UO 15195. 15296. 15402. 15514. 15631. 15756. 15887. 16025. 16171. 16326. 16489.	H-HO 26751. 27379. 28040. 28736. 29470. 30244. 31061. 31923. 32834. 33797. 34815.	(S-S0)/R -1.4519 -1.5403 -1.6275 -1.7135 -1.7986 -1.8830 -1.9667 -2.0499 -2.1327 -2.2151 -2.2974										
2720. U-UO 15337. 15438. 15545. 15657. 15776. 15901. 16033. 16172. 16319. 16474. 16638.	H-HO 26968. 27598. 28262. 28961. 29698. 30476. 31296. 32162. 33076. 34043. 35065.	(S-S0)/R -1.4255 -1.5139 -1.6009 -1.6868 -1.7718 -1.8560 -1.9396 -2.0227 -2.1053 -2.1876 -2.2697										
2740. U-UO 15479. 15581. 15688. 15801. 15921. 16046. 16179. 16318. 16466. 16622. 16787.	H-HO 27184. 27817. 28484. 29187. 29827. 30708. 31551. 32401. 33319. 34289. 35315.	(S-S0)/R -1.3993 -1.4875 -1.5744 -1.6602 -1.7451 -1.8292 -1.9127 -1.9956 -2.0781 -2.1603 -2.2422										
2760. U-UO 15622. 15724. 15832. 15946. 16065. 16192. 16325. 16465. 16614. 16771. 16936.	H-HO 27401. 28037. 28706. 29412. 30156. 30940. 31767. 32640. 33561. 34545. 35565.	(S-S0)/R -1.3732 -1.4613 -1.5481 -1.6338 -1.7186 -1.8026 -1.8859 -1.9687 -2.0511 -2.1331 -2.2149										
2780. U-UO 15764. 15867. 15976. 16090. 16210. 16337. 16471. 16612. 16762. 16919. 17086.	H-HO 27617. 28256. 28929. 29638. 30384. 31172. 32002. 32878. 33804. 34781. 35815.	(S-S0)/R -1.3473 -1.4353 -1.5220 -1.6076 -1.6922 -1.7761 -1.8593 -1.9420 -2.0242 -2.1061 -2.1878										
2800. U-UO 15907. 16011. 16120. 16235. 16356. 16483. 16618. 16760. 16910. 17068. 17235.	H-HO 27834. 28476. 29152. 29863. 30613. 31404. 32257. 33117. 34046. 35027. 36064.	(S-S0)/R -1.3216 -1.4094 -1.4960 -1.5815 -1.6660 -1.7498 -1.8329 -1.9154 -1.9975 -2.0793 -2.1608										
2820. U-UO 16050. 16154. 16264. 16379. 16501. 16629. 16764. 16907. 17058. 17217. 17385.	H-HO 28051. 28696. 29374. 30089. 30842. 31636. 32473. 33356. 34289. 35274. 36314.	(S-S0)/R -1.2959 -1.3837 -1.4702 -1.5556 -1.6400 -1.7236 -1.8066 -1.8890 -1.9709 -2.0526 -2.1340										
2840. U-UO 16193. 16298. 16408. 16524. 16647. 16776. 16911. 17055. 17206. 17366. 17535.	H-HO 28268. 28916. 29597. 30315. 31071. 31868. 32708. 33595. 34531. 35520. 36564.	(S-S0)/R -1.2705 -1.3582 -1.4445 -1.5298 -1.6141 -1.6979 -1.7804 -1.8627 -1.9445 -2.0260 -2.1073										
2860. U-UO 16337. 16442. 16553. 16670. 16792. 16922. 17059. 17203. 17355. 17515. 17685.	H-HO 28485. 29135. 29820. 30541. 31300. 32100. 32944. 33834. 34774. 35766. 36814.	(S-S0)/R -1.2451 -1.3327 -1.4190 -1.5041 -1.5883 -1.6717 -1.7944 -1.8366 -1.9183 -2.0000 -2.0808										
2880. U-UO 16480. 16586. 16698. 16815. 16938. 17069. 17206. 17351. 17503. 17663. 17835.	H-HO 28702. 29356. 30043. 30767. 31529. 32333. 33180. 34073. 35016. 36012. 37064.	(S-S0)/R -1.2200 -1.3074 -1.3936 -1.4787 -1.5627 -1.6460 -1.7280 -1.8106 -1.8922 -1.9735 -2.0544										
2900. U-UO 16624. 16731. 16843. 16960. 17085. 17215. 17353. 17499. 17652. 17814. 17986.	H-HO 28920. 29576. 30266. 30993. 31758. 32565. 33415. 34312. 35259. 36258. 37314.	(S-S0)/R -1.1949 -1.2823 -1.3684 -1.4533 -1.5373 -1.6204 -1.7029 -1.7848 -1.8663 -1.9474 -2.0282										
2920. U-UO 16768. 16875. 16988. 17106. 17231. 17362. 17501. 17647. 17801. 17964. 18136.	H-HO 29137. 29796. 30489. 31219. 31988. 32797. 33651. 34551. 35502. 36554. 37564.	(S-S0)/R -1.1700 -1.2573 -1.3433 -1.4281 -1.5120 -1.5950 -1.6774 -1.7592 -1.8405 -1.9215 -2.0022										
2940. U-UO 16912. 17020. 17133. 17252. 17377. 17509. 17649. 17796. 17951. 18114. 18287.	H-HO 29290. 30016. 30712. 31445. 32217. 33030. 33887. 34791. 35744. 36751. 37814.	(S-S0)/R -1.1452 -1.2324 -1.3183 -1.4030 -1.4868 -1.5697 -1.6520 -1.7337 -1.8149 -1.8957 -1.9763										
2960. U-UO 17057. 17165. 17278. 17398. 17524. 17657. 17797. 17944. 18100. 18264. 18438.	H-HO 29572. 30237. 30936. 31671. 32446. 33262. 34123. 35030. 35987. 36997. 38064.	(S-S0)/R -1.1206 -1.2077 -1.2935 -1.3781 -1.4618 -1.5446 -1.6267 -1.7083 -1.7894 -1.8701 -1.9505										
2980. U-UO 17201. 17310. 17424. 17544. 17671. 17804. 17945. 18093. 18249. 18414. 18589.	H-HO 29790. 30457. 31159. 31898. 32676. 33495. 34359. 35269. 36229. 37244. 38314.	(S-S0)/R -1.0961 -1.1831 -1.2688 -1.3533 -1.4369 -1.5196 -1.6016 -1.6831 -1.7640 -1.8446 -1.9249										
3000. U-UO 17346. 17455. 17570. 17691. 17818. 17952. 18093. 18242. 18399. 18565. 18740.	H-HO 30008. 30678. 31383. 32124. 32905. 33728. 34594. 35508. 36472. 37449. 38263.	(S-S0)/R -1.0718 -1.1587 -1.2443 -1.3287 -1.4121 -1.4947 -1.5766 -1.6580 -1.7388 -1.8193 -1.8995										

(Table continues)

Table 3 (Continued)

RELATIVE INTERNAL ENERGY AND ENTHALPY (CALORIES/GM-MOLE) AND RELATIVE ENTROPY

TEMPERATURE (DEGREE K)		DENSITY (AMAGAT)								
		1600.	1650.	1700.	1750.	1800.	1850.	1900.	1950.	2000.
2580.	U-U0	15957.	15945.	16134.	16333.	16545.	16770.	17010.	17264.	17535.
	H-H0	34368.	35483.	36665.	37919.	39249.	40662.	42164.	43700.	45459.
(S-S0)/R		-2.5901	-2.6331	-2.7162	-2.7993	-2.8826	-2.9664	-3.0498	-3.1338	-3.2180
2600.	U-U0	15916.	16095.	16284.	16485.	16698.	16924.	17164.	17420.	17691.
	H-H0	34622.	35741.	36928.	38186.	39521.	40938.	42444.	44046.	45749.
(S-S0)/R		-2.5212	-2.6040	-2.6869	-2.7699	-2.8530	-2.9363	-3.0198	-3.1036	-3.1876
2620.	U-U0	16065.	16244.	16435.	16636.	16850.	17077.	17319.	17575.	17848.
	H-H0	34876.	35999.	37190.	38453.	39792.	41214.	42725.	44331.	46040.
(S-S0)/R		-2.4925	-2.5752	-2.6579	-2.7407	-2.8236	-2.9067	-2.9900	-3.0735	-3.1573
2640.	U-U0	16214.	16394.	16585.	16788.	17003.	17231.	17473.	17731.	18005.
	H-H0	35130.	36258.	37452.	38719.	40063.	41490.	43006.	44616.	46330.
(S-S0)/R		-2.4640	-2.5465	-2.6290	-2.7116	-2.7944	-2.8773	-2.9604	-3.0437	-3.1273
2660.	U-U0	16363.	16544.	16736.	16940.	17156.	17385.	17628.	17887.	18162.
	H-H0	35384.	36516.	37715.	38986.	40334.	41766.	43286.	44901.	46620.
(S-S0)/R		-2.4356	-2.5180	-2.6004	-2.6828	-2.7653	-2.8481	-2.9310	-3.0141	-3.0975
2680.	U-U0	16512.	16695.	16887.	17092.	17309.	17539.	17783.	18043.	18319.
	H-H0	35638.	36774.	37977.	39253.	40606.	42041.	43566.	45186.	46909.
(S-S0)/R		-2.4075	-2.4897	-2.5719	-2.6541	-2.7365	-2.8190	-2.9017	-2.9847	-3.0678
2700.	U-U0	16662.	16845.	17039.	17244.	17462.	17693.	17938.	18199.	18476.
	H-H0	35892.	37032.	38239.	39519.	40876.	42317.	43846.	45471.	47199.
(S-S0)/R		-2.3795	-2.4615	-2.5436	-2.6256	-2.7078	-2.7902	-2.8727	-2.9554	-3.0384
2720.	U-U0	16812.	16995.	17190.	17396.	17615.	17847.	18094.	18356.	18634.
	H-H0	36146.	37290.	3802.	39784.	41147.	42592.	44126.	45756.	47488.
(S-S0)/R		-2.3517	-2.4335	-2.5154	-2.5973	-2.6794	-2.7615	-2.8438	-2.9264	-3.0092
2740.	U-U0	16962.	17146.	17342.	17549.	17769.	18002.	18249.	18512.	18791.
	H-H0	36400.	37548.	38764.	40052.	41418.	42867.	44466.	46040.	47777.
(S-S0)/R		-2.3240	-2.4058	-2.4875	-2.5682	-2.6510	-2.7330	-2.8152	-2.8975	-2.9801
2760.	U-U0	17112.	17297.	17494.	17702.	17922.	18156.	18405.	18669.	18949.
	H-H0	36653.	37806.	39026.	40318.	41689.	43142.	44689.	46324.	48066.
(S-S0)/R		-2.2966	-2.3781	-2.4597	-2.5413	-2.6229	-2.7047	-2.7867	-2.8689	-2.9512
2780.	U-U0	17262.	17448.	17645.	17854.	18076.	18311.	18561.	18825.	19107.
	H-H0	36907.	38063.	39288.	40585.	41959.	43417.	44965.	46608.	48355.
(S-S0)/R		-2.2693	-2.3507	-2.4321	-2.5135	-2.5950	-2.6766	-2.7584	-2.8404	-2.9226
2800.	U-U0	17412.	17599.	17798.	18007.	18230.	18466.	18716.	18982.	19265.
	H-H0	37161.	38321.	39550.	40851.	42230.	43692.	45244.	46892.	48644.
(S-S0)/R		-2.2421	-2.3234	-2.4046	-2.4859	-2.5672	-2.6487	-2.7303	-2.8121	-2.8941
2820.	U-U0	17563.	17751.	17950.	18161.	18384.	18621.	18872.	19139.	19423.
	H-H0	37415.	38579.	39811.	41117.	42500.	43967.	45523.	47176.	48932.
(S-S0)/R		-2.2152	-2.2963	-2.3773	-2.4584	-2.5396	-2.6209	-2.7023	-2.7839	-2.8657
2840.	U-U0	17713.	17902.	18102.	18314.	18538.	18776.	19029.	19297.	19581.
	H-H0	37669.	38837.	40073.	41383.	42770.	44242.	45803.	47460.	49220.
(S-S0)/R		-2.1884	-2.2693	-2.3502	-2.4312	-2.5122	-2.5933	-2.6745	-2.7560	-2.8376
2860.	U-U0	17864.	18054.	18255.	18467.	18693.	18932.	19185.	19454.	19740.
	H-H0	37922.	39095.	40335.	41649.	43040.	44516.	46081.	47743.	49509.
(S-S0)/R		-2.1617	-2.2425	-2.3233	-2.4041	-2.4849	-2.5658	-2.6469	-2.7282	-2.8096
2880.	U-U0	18015.	18206.	18408.	18621.	18847.	19087.	19341.	19611.	19898.
	H-H0	38176.	39352.	40597.	41914.	43311.	44790.	46360.	48027.	49796.
(S-S0)/R		-2.1352	-2.2159	-2.2965	-2.3771	-2.4578	-2.5386	-2.6195	-2.7006	-2.7818
2900.	U-U0	18167.	18358.	18560.	18775.	19002.	19243.	19498.	19769.	20057.
	H-H0	38430.	39610.	40858.	42180.	43581.	45065.	46639.	48310.	50084.
(S-S0)/R		-2.1069	-2.1894	-2.2699	-2.3503	-2.4309	-2.5115	-2.5922	-2.6731	-2.7542
2920.	U-U0	18318.	18510.	18713.	18929.	19157.	19398.	19655.	19927.	20215.
	H-H0	38684.	39867.	41120.	42446.	43850.	45339.	46918.	48593.	50372.
(S-S0)/R		-2.0827	-2.1631	-2.2434	-2.3237	-2.4041	-2.4845.	-2.5651.	-2.6458.	-2.7267
2940.	U-U0	18469.	18662.	18867.	19083.	19312.	19554.	19811.	20084.	20374.
	H-H0	38937.	40125.	41382.	42712.	44120.	45613.	47196.	48876.	50659.
(S-S0)/R		-2.0567	-2.1369	-2.2171	-2.2972	-2.3774	-2.4577.	-2.5382	-2.6187	-2.6995
2960.	U-U0	18621.	18815.	19020.	19237.	19467.	19710.	19968.	20242.	20533.
	H-H0	39191.	40383.	41643.	42977.	44390.	45887.	47474.	49159.	50946.
(S-S0)/R		-2.0308	-2.1109	-2.1909	-2.2709	-2.3510	-2.4311	-2.5114	-2.5918.	-2.6723
2980.	U-U0	18773.	18968.	19173.	19391.	19622.	19866.	20126.	20400.	20692.
	H-H0	39445.	40640.	41905.	43243.	44660.	46161.	47753.	49441.	51234.
(S-S0)/R		-2.0050	-2.0850	-2.1649	-2.2448	-2.3247	-2.4046	-2.4847	-2.5650	-2.6454
3000.	U-U0	18925.	19120.	19327.	19546.	19777.	20023.	20283.	20559.	20851.
	H-H0	39698.	40898.	42166.	43508.	44929.	46435.	48031.	49724.	51521.
(S-S0)/R		-1.9794	-2.0593	-2.1390	-2.2188	-2.2985	-2.3783	-2.4583	-2.5383	-2.6186

Table 4
Selected Hydrogen Properties and the Portions Thereof
Contributed by Each Energy Factor

DENSITY = 1.00 (AMAGAT)
VOLUME = 22428.00 (CC/MOLE)

T(K)	P(ATM)	U/RT	H/RT	(S-S ₀)/R	CV/R	CP/R	
500,	1.83	2.452 1.500 0.000 0.952	3.453 2.500 0.001 0.952	1.509 0.907 0.000 0.602	2.520 1.500 0.000 1.019	3.519 2.500 0.000 1.019	TOTAL TRANSLATION POTENTIAL VIBR/ROT
600,	2.20	2.464 1.500 0.000 0.964	3.465 2.500 0.001 0.964	1.969 1.180 0.000 0.789	2.528 1.500 0.000 1.028	3.528 2.500 0.000 1.028	TOTAL TRANSLATION POTENTIAL VIBR/ROT
800,	2.93	2.484 1.500 0.000 0.983	3.484 2.500 0.001 0.983	2.700 1.612 0.000 1.089	2.563 1.500 0.000 1.063	3.563 2.500 -0.000 1.063	TOTAL TRANSLATION POTENTIAL VIBR/ROT
1000,	3.66	2.506 1.500 0.000 1.006	3.507 2.500 0.001 1.006	3.279 1.946 0.000 1.333	2.633 1.500 0.000 1.133	3.633 2.500 -0.000 1.133	TOTAL TRANSLATION POTENTIAL VIBR/ROT
1200,	4.39	2.535 1.500 0.000 1.035	3.536 2.500 0.001 1.035	3.767 2.220 0.000 1.547	2.728 1.500 0.000 1.228	3.727 2.500 -0.000 1.228	TOTAL TRANSLATION POTENTIAL VIBR/ROT
1500,	5.49	2.589 1.500 0.000 1.089	3.590 2.500 0.001 1.089	4.393 2.554 0.000 1.838	2.884 1.500 0.000 1.384	3.884 2.500 -0.000 1.384	TOTAL TRANSLATION POTENTIAL VIBR/ROT
2000,	7.32	2.693 1.500 0.000 1.193	3.694 2.500 0.001 1.193	5.256 2.986 0.000 2.270	3.120 1.500 0.000 1.620	4.120 2.500 -0.000 1.620	TOTAL TRANSLATION POTENTIAL VIBR/ROT
2500,	9.15	2.798 1.500 0.000 1.298	3.798 2.500 0.001 1.298	5.973 3.321 0.000 2.652	3.302 1.500 0.000 1.802	4.302 2.500 -0.000 1.802	TOTAL TRANSLATION POTENTIAL VIBR/ROT
3000,	10.98	2.894 1.500 0.000 1.394	3.895 2.500 0.001 1.394	6.588 3.594 0.000 2.993	3.441 1.500 0.000 1.941	4.441 2.500 -0.000 1.941	TOTAL TRANSLATION POTENTIAL VIBR/ROT

(Table continues)

Table 4 (Continued)

DENSITY = 10.00 (AMAGAT)
 VOLUME = 2242.80 (CC/MOLE)

T(K)	P(ATM)	U/RT	H/RT	(S-S0)/R	CV/R	CP/R	
500.	18.46	2.452	3.462	-0.801	2.521	3.520	TOTAL
		1.500	2.500	-1.396	1.500	2.500	TRANSLATION
		0.001	0.010	-0.007	0.002	0.001	POTENTIAL
		0.952	0.952	0.602	1.019	1.019	VIBR/ROT
600.	22.15	2.465	3.473	-0.341	2.529	3.528	TOTAL
		1.500	2.500	-1.123	1.500	2.500	TRANSLATION
		0.001	0.010	-0.007	0.002	0.000	POTENTIAL
		0.964	0.964	0.789	1.028	1.028	VIBR/ROT
800.	29.52	2.484	3.493	0.391	2.565	3.563	TOTAL
		1.500	2.500	-0.691	1.500	2.500	TRANSLATION
		0.001	0.010	-0.007	0.002	-0.000	POTENTIAL
		0.983	0.983	1.089	1.063	1.063	VIBR/ROT
1000.	36.89	2.507	3.515	0.970	2.635	3.632	TOTAL
		1.500	2.500	-0.356	1.500	2.500	TRANSLATION
		0.001	0.010	-0.006	0.002	-0.001	POTENTIAL
		1.006	1.006	1.333	1.133	1.133	VIBR/ROT
1200.	44.26	2.536	3.544	1.459	2.729	3.727	TOTAL
		1.500	2.500	-0.083	1.500	2.500	TRANSLATION
		0.001	0.009	-0.006	0.002	-0.001	POTENTIAL
		1.035	1.035	1.547	1.228	1.228	VIBR/ROT
1500.	55.31	2.590	3.598	2.084	2.886	3.883	TOTAL
		1.500	2.500	0.252	1.500	2.500	TRANSLATION
		0.001	0.009	-0.006	0.002	-0.001	POTENTIAL
		1.089	1.089	1.838	1.384	1.384	VIBR/ROT
2000.	73.72	2.695	3.702	2.948	3.121	4.119	TOTAL
		1.500	2.500	0.683	1.500	2.500	TRANSLATION
		0.001	0.009	-0.005	0.001	-0.001	POTENTIAL
		1.193	1.193	2.270	1.620	1.620	VIBR/ROT
2500.	92.13	2.799	3.806	3.665	3.303	4.300	TOTAL
		1.500	2.500	1.018	1.500	2.500	TRANSLATION
		0.001	0.009	-0.005	0.001	-0.001	POTENTIAL
		1.298	1.298	2.652	1.802	1.802	VIBR/ROT
3000.	110.52	2.895	3.902	4.280	3.442	4.439	TOTAL
		1.500	2.500	1.292	1.500	2.500	TRANSLATION
		0.001	0.008	-0.005	0.001	-0.001	POTENTIAL
		1.394	1.394	2.993	1.941	1.941	VIBR/ROT

(Table continues)

Table 4 (Continued)

DENSITY = 100.00 (AMAGAT)
 VOLUME = 224.28 (CC/MOLE)

T(K)	P(ATM)	U/RT	H/RT	(S-S0)/R	CV/R	CP/R	
500,	200.40	2.459 1.500 0.007 0.952	3.554 2.500 0.102 0.952	-3.181 -3.699 -0.085 0.602	2.538 1.500 0.019 1.019	3.528 2.500 0.009 1.019	TOTAL TRANSLATION POTENTIAL VIBR/ROT
600,	240.14	2.473 1.500 0.009 0.964	3.567 2.500 0.103 0.964	-2.718 -3.425 -0.081 0.789	2.546 1.500 0.018 1.028	3.532 2.500 0.004 1.028	TOTAL TRANSLATION POTENTIAL VIBR/ROT
800,	319.28	2.495 1.500 0.011 0.983	3.585 2.500 0.102 0.983	-1.981 -2.994 -0.076 1.089	2.581 1.500 0.018 1.063	3.562 2.500 -0.001 1.063	TOTAL TRANSLATION POTENTIAL VIBR/ROT
1000,	398.08	2.518 1.500 0.012 1.006	3.606 2.500 0.100 1.006	-1.399 -2.659 -0.072 1.333	2.650 1.500 0.017 1.133	3.629 2.500 -0.004 1.133	TOTAL TRANSLATION POTENTIAL VIBR/ROT
1200,	476.62	2.548 1.500 0.013 1.035	3.633 2.500 0.099 1.035	-0.907 -2.385 -0.069 1.547	2.744 1.500 0.016 1.228	3.721 2.500 -0.007 1.228	TOTAL TRANSLATION POTENTIAL VIBR/ROT
1500,	594.05	2.603 1.500 0.014 1.089	3.685 2.500 0.096 1.089	-0.279 -2.051 -0.066 1.838	2.900 1.500 0.016 1.384	3.876 2.500 -0.009 1.384	TOTAL TRANSLATION POTENTIAL VIBR/ROT
2000,	789.00	2.707 1.500 0.014 1.193	3.786 2.500 0.092 1.193	0.589 -1.619 -0.061 2.270	3.135 1.500 0.015 1.620	4.109 2.500 -0.010 1.620	TOTAL TRANSLATION POTENTIAL VIBR/ROT
2500,	983.24	2.812 1.500 0.014 1.298	3.887 2.500 0.089 1.298	1.309 -1.285 -0.058 2.652	3.316 1.500 0.014 1.802	4.290 2.500 -0.011 1.802	TOTAL TRANSLATION POTENTIAL VIBR/ROT
3000,	1176.93	2.908 1.500 0.014 1.394	3.980 2.500 0.086 1.394	1.926 -1.011 -0.056 2.993	3.454 1.500 0.014 1.941	4.429 2.500 -0.012 1.941	TOTAL TRANSLATION POTENTIAL VIBR/ROT

(Table continues)

Table 4 (Continued)

DENSITY = 500.00 (AMAGAT) VOLUME = 44.86 (CC/MOLE)							
T(K)	P(ATM)	U/RT	H/RT	(S-S0)/R	CV/R	CP/R	
500.	1473.47	2.496	4.107	-5.185	2.640	3.634	TOTAL
		1.500	2.500	-5.308	1.500	2.500	TRANSLATION
		0.045	0.656	-0.479	0.121	0.115	POTENTIAL
		0.952	0.952	0.602	1.019	1.019	VIBR/ROT
600.	1754.64	2.521	4.119	-4.703	2.644	3.615	TOTAL
		1.500	2.500	-5.035	1.500	2.500	TRANSLATION
		0.057	0.656	-0.458	0.116	0.087	POTENTIAL
		0.964	0.964	0.789	1.028	1.028	VIBR/ROT
800.	2303.84	2.554	4.128	-3.940	2.672	3.615	TOTAL
		1.500	2.500	-4.603	1.500	2.500	TRANSLATION
		0.071	0.645	-0.425	0.109	0.052	POTENTIAL
		0.983	0.983	1.089	1.063	1.063	VIBR/ROT
1000.	2840.07	2.584	4.136	-3.337	2.736	3.664	TOTAL
		1.500	2.500	-4.268	1.500	2.500	TRANSLATION
		0.078	0.630	-0.402	0.103	0.031	POTENTIAL
		1.006	1.006	1.333	1.133	1.133	VIBR/ROT
1200.	3366.65	2.616	4.150	-2.831	2.826	3.744	TOTAL
		1.500	2.500	-3.995	1.500	2.500	TRANSLATION
		0.082	0.615	-0.383	0.099	0.016	POTENTIAL
		1.035	1.035	1.547	1.228	1.228	VIBR/ROT
1500.	4142.75	2.673	4.183	-2.184	2.978	3.886	TOTAL
		1.500	2.500	-3.660	1.500	2.500	TRANSLATION
		0.085	0.594	-0.362	0.093	0.002	POTENTIAL
		1.089	1.089	1.838	1.384	1.384	VIBR/ROT
2000.	5409.27	2.779	4.258	-1.295	3.207	4.107	TOTAL
		1.500	2.500	-3.229	1.500	2.500	TRANSLATION
		0.086	0.564	-0.336	0.087	-0.012	POTENTIAL
		1.193	1.193	2.270	1.620	1.620	VIBR/ROT
2500.	6651.34	2.883	4.338	-0.559	3.384	4.281	TOTAL
		1.500	2.500	-2.894	1.500	2.500	TRANSLATION
		0.086	0.540	-0.317	0.082	-0.021	POTENTIAL
		1.298	1.298	2.652	1.802	1.802	VIBR/ROT
3000.	7875.26	2.978	4.413	0.070	3.519	4.414	TOTAL
		1.500	2.500	-2.620	1.500	2.500	TRANSLATION
		0.085	0.520	-0.302	0.078	-0.027	POTENTIAL
		1.394	1.394	2.993	1.941	1.941	VIBR/ROT

(Table continues)

Table 4 (Continued)

DENSITY = 1000.00 (AMAGAT)
 VOLUME = 22.43 (CC/MOLE)

T(K)	P(ATM)	U/RT	H/RT	(S-S0)/R	CV/R	CP/R	
500.	5022.73	2.579	5.325	-6.526	2.860	3.946	TOTAL
		1.500	2.500	-6.001	1.500	2.500	TRANSLATION
		0.127	1.873	-1.127	0.340	0.426	POTENTIAL
		0.952	0.952	0.602	1.019	1.019	VIBR/ROT
600.	5924.50	2.625	5.324	-6.005	2.851	3.876	TOTAL
		1.500	2.500	-5.728	1.500	2.500	TRANSLATION
		0.161	1.860	-1.066	0.323	0.348	POTENTIAL
		0.964	0.964	0.789	1.028	1.028	VIBR/ROT
800.	7632.92	2.682	5.289	-5.185	2.858	3.811	TOTAL
		1.500	2.500	-5.296	1.500	2.500	TRANSLATION
		0.198	1.806	-0.977	0.295	0.247	POTENTIAL
		0.983	0.983	1.089	1.063	1.063	VIBR/ROT
1000.	9250.74	2.721	5.250	-4.543	2.907	3.819	TOTAL
		1.500	2.500	-4.962	1.500	2.500	TRANSLATION
		0.215	1.744	-0.914	0.274	0.186	POTENTIAL
		1.006	1.006	1.333	1.133	1.133	VIBR/ROT
1200.	10803.76	2.758	5.219	-4.006	2.985	3.871	TOTAL
		1.500	2.500	-4.688	1.500	2.500	TRANSLATION
		0.224	1.684	-0.866	0.257	0.144	POTENTIAL
		1.035	1.035	1.547	1.228	1.228	VIBR/ROT
1500.	13044.09	2.817	5.194	-3.326	3.123	3.985	TOTAL
		1.500	2.500	-4.353	1.500	2.500	TRANSLATION
		0.228	1.605	-0.810	0.239	0.101	POTENTIAL
		1.089	1.089	1.838	1.384	1.384	VIBR/ROT
2000.	16609.46	2.921	5.191	-2.397	3.336	4.178	TOTAL
		1.500	2.500	-3.922	1.500	2.500	TRANSLATION
		0.228	1.498	-0.745	0.217	0.058	POTENTIAL
		1.193	1.193	2.270	1.620	1.620	VIBR/ROT
2500.	20027.49	3.022	5.211	-1.634	3.503	4.333	TOTAL
		1.500	2.500	-3.587	1.500	2.500	TRANSLATION
		0.224	1.414	-0.698	0.201	0.032	POTENTIAL
		1.298	1.298	2.652	1.802	1.802	VIBR/ROT
3000.	23339.58	3.113	5.239	-0.983	3.630	4.455	TOTAL
		1.500	2.500	-3.314	1.500	2.500	TRANSLATION
		0.219	1.346	-0.663	0.190	0.014	POTENTIAL
		1.394	1.394	2.993	1.941	1.941	VIBR/ROT

(Table continues)

Table 4 (Continued)

DENSITY = 1500.00 (AMAGAT) VOLUME = 14.95 (CC/MOLE)							
T(K)	P(ATM)	U/RT	H/RT	(S-S0)/R	CV/R	CP/R	
500.	13741.25	2.744	7.752	-7.847	3.288	4.554	TOTAL
		1.500	2.500	-6.407	1.500	2.500	TRANSLATION
		0.293	4.300	-2.043	0.768	1.034	POTENTIAL
		0.952	0.952	0.602	1.019	1.019	VIBR/ROT
600.	16014.26	2.831	7.694	-7.252	3.241	4.379	TOTAL
		1.500	2.500	-6.133	1.500	2.500	TRANSLATION
		0.367	4.231	-1.907	0.714	0.852	POTENTIAL
		0.964	0.964	0.789	1.028	1.028	VIBR/ROT
800.	20146.93	2.926	7.515	-6.328	3.190	4.182	TOTAL
		1.500	2.500	-5.702	1.500	2.500	TRANSLATION
		0.442	4.031	-1.715	0.627	0.619	POTENTIAL
		0.983	0.983	1.089	1.063	1.063	VIBR/ROT
1000.	23905.11	2.979	7.334	-5.616	3.198	4.111	TOTAL
		1.500	2.500	-5.367	1.500	2.500	TRANSLATION
		0.473	3.829	-1.582	0.565	0.478	POTENTIAL
		1.006	1.006	1.333	1.133	1.133	VIBR/ROT
1200.	27409.02	3.019	7.181	-5.029	3.246	4.112	TOTAL
		1.500	2.500	-5.094	1.500	2.500	TRANSLATION
		0.484	3.646	-1.483	0.519	0.384	POTENTIAL
		1.035	1.035	1.547	1.228	1.228	VIBR/ROT
1500.	32330.88	3.074	7.002	-4.294	3.382	4.175	TOTAL
		1.500	2.500	-4.759	1.500	2.500	TRANSLATION
		0.486	3.413	-1.373	0.468	0.291	POTENTIAL
		1.089	1.089	1.838	1.384	1.384	VIBR/ROT
2000.	39932.48	3.167	6.805	-3.304	3.532	4.317	TOTAL
		1.500	2.500	-4.327	1.500	2.500	TRANSLATION
		0.474	3.112	-1.247	0.412	0.197	POTENTIAL
		1.193	1.193	2.270	1.620	1.620	VIBR/ROT
2500.	47032.01	3.255	6.683	-2.500	3.677	4.444	TOTAL
		1.500	2.500	-3.993	1.500	2.500	TRANSLATION
		0.457	2.885	-1.159	0.375	0.142	POTENTIAL
		1.298	1.298	2.652	1.802	1.802	VIBR/ROT
3000.	53784.35	3.335	6.602	-1.819	3.789	4.546	TOTAL
		1.500	2.500	-3.719	1.500	2.500	TRANSLATION
		0.441	2.708	-1.093	0.348	0.105	POTENTIAL
		1.394	1.394	2.993	1.941	1.941	VIBR/ROT

(Table continues)

Table 4 (Continued)

DENSITY = 2000.00 (AMAGAT)
 VOLUME = 11.21 (CC/MOLE)

T(K)	P(ATM)	U/RT	H/RT	(S-S0)/R	CV/R	CP/R	
500,	36522.68	3.108 1.500 0.656 0.952	13.090 2.500 9.638 0.952	-9.507 -6.694 -3.415 0.602	4.197 1.500 1.678 1.019	5.733 2.500 2.213 1.019	TOTAL TRANSLATION POTENTIAL VIBR/ROT
600,	41888.25	3.276 1.500 0.812 0.964	12.816 2.500 9.353 0.964	-8.756 -6.421 -3.124 0.789	4.037 1.500 1.510 1.028	5.317 2.500 1.790 1.028	TOTAL TRANSLATION POTENTIAL VIBR/ROT
800,	51074.86	3.436 1.500 0.952 0.983	12.161 2.500 8.677 0.983	-7.628 -5.989 -2.727 1.089	3.817 1.500 1.254 1.063	4.828 2.500 1.265 1.063	TOTAL TRANSLATION POTENTIAL VIBR/ROT
1000,	58959.29	3.500 1.500 0.994 1.006	11.558 2.500 8.052 1.006	-6.789 -5.655 -2.467 1.333	3.714 1.500 1.081 1.133	4.592 2.500 0.959 1.133	TOTAL TRANSLATION POTENTIAL VIBR/ROT
1200,	66024.48	3.533 1.500 0.998 1.035	11.052 2.500 7.517 1.035	-6.115 -5.381 -2.281 1.547	3.687 1.500 0.960 1.228	4.491 2.500 0.763 1.228	TOTAL TRANSLATION POTENTIAL VIBR/ROT
1500,	75616.20	3.566 1.500 0.977 1.089	10.455 2.500 6.866 1.089	-5.290 -5.046 -2.082 1.838	3.718 1.500 0.834 1.384	4.459 2.500 0.575 1.384	TOTAL TRANSLATION POTENTIAL VIBR/ROT
2000,	89910.02	3.617 1.500 0.924 1.193	9.760 2.500 6.067 1.193	-4.206 -4.615 -1.861 2.270	3.824 1.500 0.704 1.620	4.516 2.500 0.396 1.620	TOTAL TRANSLATION POTENTIAL VIBR/ROT
2500,	102878.64	3.669 1.500 0.871 1.298	9.293 2.500 5.495 1.298	-3.342 -4.280 -1.713 2.652	3.926 1.500 0.624 1.802	4.596 2.500 0.294 1.802	TOTAL TRANSLATION POTENTIAL VIBR/ROT
3000,	114976.53	3.719 1.500 0.825 1.394	8.956 2.500 5.063 1.394	-2.619 -4.007 -1.605 2.993	4.009 1.500 0.568 1.941	4.669 2.500 0.228 1.941	TOTAL TRANSLATION POTENTIAL VIBR/ROT

Appendix A

MOLECULAR POTENTIAL CORRECTION TO THERMODYNAMIC PROPERTIES

The purpose of this appendix is to develop the contributions of a dense gas to the thermodynamic properties that are due to the potential energy between the molecules. The starting point is the following equation which links classical and statistical thermodynamics:

$$P = RT \left(\frac{\partial}{\partial v} \ln Q \right)_T \quad (A1)$$

or

$$\frac{Pv}{RT} = v \left(\frac{\partial}{\partial v} \ln Q \right)_T , \quad (A2)$$

where Q is the total partition function.

Rowlinson* has suggested the following equation of state for dense gases:

$$\frac{Pv}{RT} = Z = \frac{1 + \xi + \xi^2}{(1 - \xi)^3} , \quad (A3)$$

where

$$\xi = \frac{b_m}{4v} x^{1/4} \left[1 + \frac{1}{12} F(x) \right]^3 ,$$

in which

$$x = \frac{\epsilon}{kT}$$

and

$$F(x) = \gamma_e - \sum_{l=1}^{\infty} \frac{\left(\frac{l}{2} - 1\right)! (2\sqrt{x})^l}{l!} ,$$

with γ_e being Euler's constant.

The volume dependent terms in the partition function are due to the translational and potential energy of the molecule. The contribution of the potential energy alone can be found by subtracting from the compressibility the contribution of the translational energy, which is a constant and equal to one. Then, by substituting Eq. (A3) into Eq. (A2) and integrating, the partition function associated with the potential energy (denoted by the subscript p) may be obtained as follows:

*J. S. Rowlinson, "An Equation of State of Gases at High Temperatures and Densities," Mol. Phys. 7(No. 14):349-361 (1963-1964).

$$Z - 1 = \frac{(4 - 2\xi + \xi^2)\xi}{(1 - \xi)^3} = v \left(\frac{\partial}{\partial v} \ln Q_p \right)_T = -\xi \left(\frac{d}{d\xi} \ln Q_p \right)_T, \quad (\text{A4})$$

since

$$\frac{d\xi}{\xi} = -\phi \frac{dT}{T} - \frac{dv}{v};$$

thus,

$$\left(\frac{dv}{v} \right)_T = -\frac{d\xi}{\xi}.$$

Then integrating Eq. (A4):

$$\int_1^{Q_p} \partial \ln Q_p = - \int_0^\xi \frac{4 - 2\xi + \xi^2}{(1 - \xi)^3} d\xi, \quad (\text{A5})$$

the results are

$$\ln Q_p = \ln(1 - \xi) - \frac{3}{2(1 - \xi)^2} + \frac{3}{2} \quad (\text{A6})$$

or

$$Q_p = (1 - \xi) e^{-3/2(1 - \xi)^2 + 3/2} \quad (\text{A7})$$

The total partition function can now be obtained by multiplying Q_p by those factors associated with the other types of energy to be considered.

The contribution to the thermodynamic properties of a dense gas due to the potential energy between the molecules can now be obtained using the following statistical thermodynamic equations:

$$\frac{u_p}{RT} = \left(\frac{\partial \ln Q_p}{\partial \ln T} \right)_v = \phi(Z - 1), \quad (\text{A8})$$

where

$$\phi = \frac{1}{4} \left[1 - \frac{G(x)}{\left(1 + \frac{F(x)}{12} \right)} \right]$$

and

$$G(x) = -x \frac{dF}{dx},$$

$$\frac{h_p}{RT} = \frac{u_p}{RT} + \left(\frac{Pv}{RT} - 1 \right) = (\phi + 1)(Z - 1), \quad (\text{A9})$$

$$\frac{s_p}{RT} = \frac{u_p}{RT} + \ln Q_p = \phi(Z - 1) - \frac{3}{2(1 - \xi)^2} + \frac{3}{2} + \ln(1 - \xi), \quad (\text{A10})$$

$$\frac{c_v}{R} = \frac{1}{R} \left(\frac{\partial u_p}{\partial T} \right)_v = \phi(Z-1) \left(1 + D\phi - \frac{\phi ZZ'}{Z-1} \right), \quad (\text{A11})$$

where

$$D\phi = \frac{T}{\phi} \frac{d\phi}{dT}$$

and

$$Z' = \frac{\xi}{Z} \frac{dZ}{d\xi},$$

and

$$\frac{c_p}{R} - \frac{c_v}{R} = \frac{1}{R} \left[P + \left(\frac{\partial u}{\partial v} \right)_T \right] \left[\left(\frac{\partial v}{\partial T} \right)_p - \frac{R}{P} \right] = \frac{Z(1-\phi Z')^2}{1+Z'} - 1. \quad (\text{A12})$$

Appendix B
GRAPHS OF SELECTED THERMODYNAMIC
PROPERTIES OF HYDROGEN

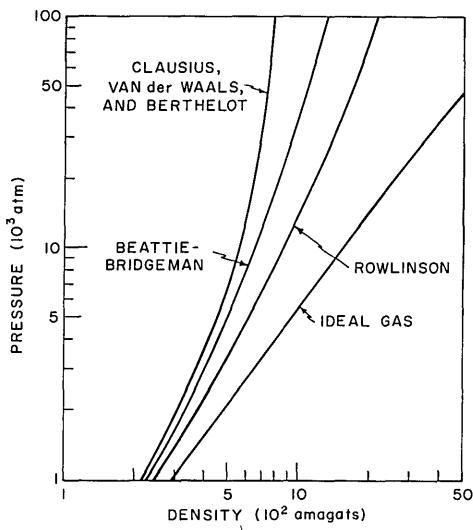


Fig. B1 - Comparison of Rowlinson equation of state with other well-known equations of state with initial gas state of 16 atm and 290°K

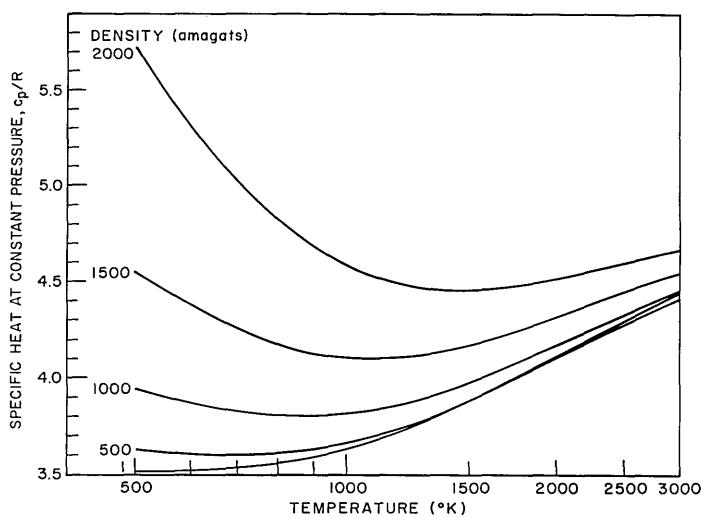


Fig. B2 - Specific heat at constant pressure
vs temperature for constant density

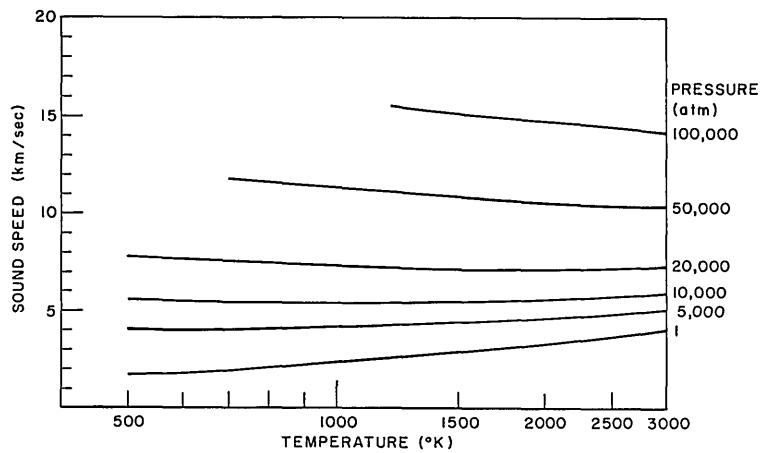


Fig. B3 - Sound speed vs temperature
for constant pressure

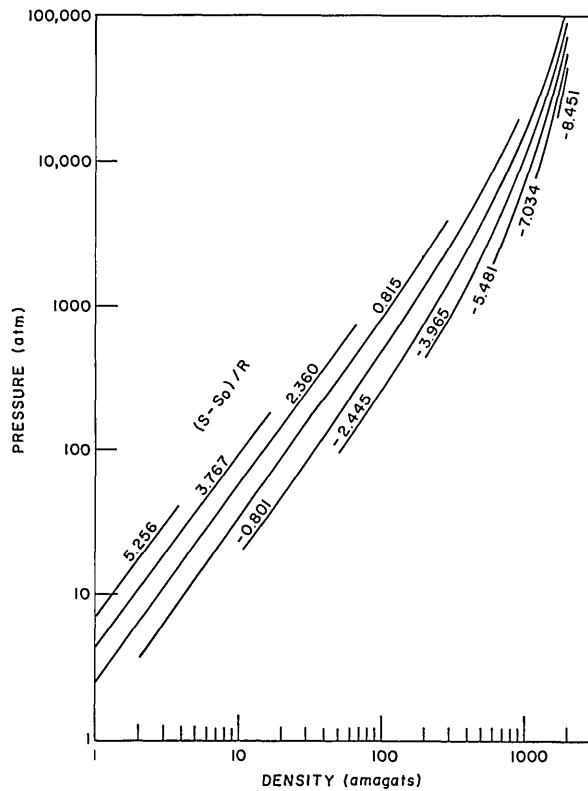


Fig. B4 - Pressure vs density
for constant entropy

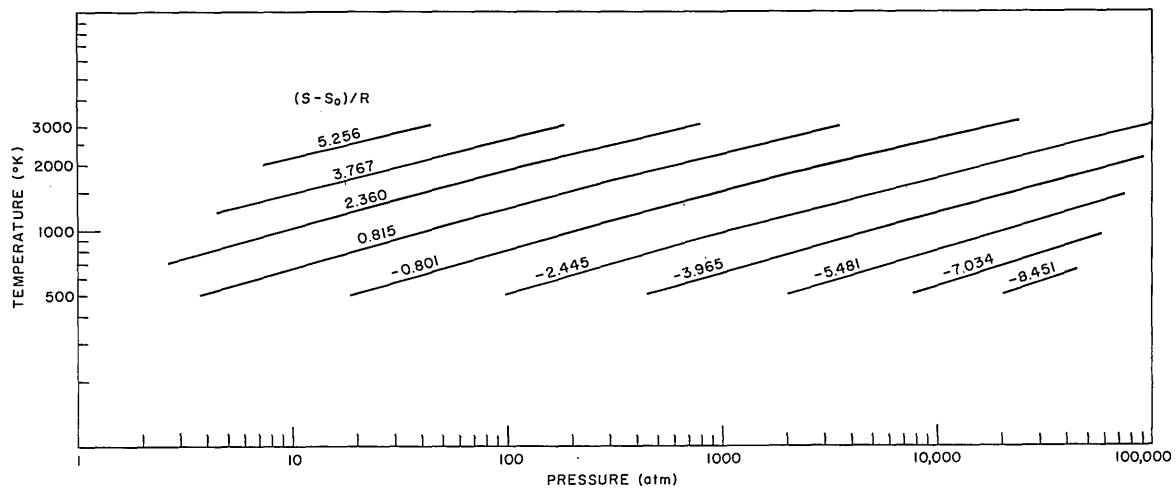


Fig. B5 - Temperature vs pressure for constant entropy

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The partition function corresponding to an equation of state for a high-temperature, high-density gas suggested by J. S. Rowlinson has been derived. The equations for selected thermodynamic properties of the gas are obtained from this partition function using statistical thermodynamics. These equations are used to calculate results for the case of hydrogen in the range of temperature between 500°K and 3000°K and in the range of density between 1 and 2000 amagats.	

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